

## B25J

**MANIPULATORS; CHAMBERS PROVIDED WITH MANIPULATION DEVICES** ([N: manipulators specially adapted for use in surgery A61B19/00M; manipulators used in cleaning hollow articles B08B9/04]; manipulators associated with rolling mills B21B39/20; manipulators associated with forging machines B21J13/10; [N: manipulators associated with picking-up and placing mechanisms B23P19/007]; means for holding wheels or parts thereof B60B30/00; [N: vehicles with ground-engaging propulsion means, e.g. walking members B62D57/02, B62D57/032; devices for picking-up and depositing articles or materials between conveyers B65G47/90, B65G47/91; manipulators with gripping or holding means for transferring packages B65H67/065]; cranes B66C; [N: manipulators used in the protection or supervision of pipe-line installations F17D5/00; walking equipment adapted for nuclear steam-generators F22B37/006]; manipulators specially adapted for, or associated with, nuclear reactors G21C; [N: apparatus used for handling wafers during manufacture or treatment of semiconductor H01L21/68])

### Definition statement

*This subclass/group covers:*

Handling tools, devices, or machines having a gripping or work head capable of bodily movement in space and of change of orientation, such bodily movement and change of orientation being controlled, at will, by means remote from the head. The group [B25J 21/00](#) moreover covers chambers provided with manipulation devices.

Most of the manipulators classified in [B25J](#) are industrial robots.

The International Organization for Standardization gives the following definition of an industrial robot in ISO 8373:

an automatically controlled, reprogrammable, multipurpose manipulator programmable in three or more axes, which may be either fixed in place or mobile for use in industrial automation applications.

This definition is used by the International Federation of Robotics, the European Robotics Research Network (EURON) and many national standards committees.

Here is a list of other types of manipulators or robots classified in [B25J](#), i.e. manipulators which are usually not industrial robots:

Manipulators positioned in space by hand	<a href="#">B25J 1/00</a>	1
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Manipulators not otherwise provided for	<a href="#">B25J 11/00</a>
Master-slave manipulators	<a href="#">B25J 3/00</a>
Manipulators mounted on wheels or on carriages	<a href="#">B25J 5/00</a> , <a href="#">B25J 9/162</a>
Micromanipulators	<a href="#">B25J 7/00</a>
Service robots	<a href="#">B25J 9/0003</a>
Exoskeletons	<a href="#">B25J 9/0006</a>
Manipulators moved by gravity	<a href="#">B25J 9/1055</a>
Manipulators comprising mechanical "programming" means, e.g. cams	<a href="#">B25J 9/109</a>
Cellular, reconfigurable manipulators, e.g. cebot	<a href="#">B25J 9/1617</a>

## References relevant to classification in this subclass

*This subclass/group does not cover:*

Examples of places where the subject matter of this subclass is covered when specially adapted, used for particular purpose, or incorporated in a larger system:

Manipulators for surgery	<a href="#">A61B 19/00M</a>
Spray heads moved by robots or articulated arms	<a href="#">B05B 13/0431</a>
Manipulators for transferring metal sheets from / to a press	<a href="#">B21D 43/105</a>
Manipulators in machines for forging, hammering, pressing riveting	<a href="#">B21J 13/10</a>
Manipulators for moving laser head in more than two directions	<a href="#">B23K 26/10B</a>
Manipulators for moving workpieces	<a href="#">B29C 37/0007</a>

between mould parts	
Manipulators in machines for gluing by wetting	<a href="#">B65C 9/2226</a>
Manipulators for handling sheets	<a href="#">B65G 49/067</a>
Manipulators for stacking or de-stacking articles	<a href="#">B65G 61/00</a>
Manipulators with gripping or holding means for transferring the packages from one station to another	<a href="#">B65H 67/065</a>
Micro-manipulators for assembling MEMS	<a href="#">B81B 7/00M</a>
Manipulators for underwater operations	<a href="#">E21B 41/04</a>
Automatic analysis systems comprising robots	<a href="#">G01N 35/0099</a>
Manipulators integrated in shielded cells	<a href="#">G21F 7/061</a>
Manipulators for transferring wafers	<a href="#">H01L 21/67742</a> , <a href="#">H01L 21/67766</a> , <a href="#">H01L 21/68707</a>
Pick and place apparatus for mounting of components	<a href="#">H05K 13/0404</a>

## **B25J 1/00**

**Manipulators positioned in space by hand (of master-slave type B25J3/00; micromanipulators B25J7/00)**

### **Definition statement**

*This subclass/group covers:*

Manipulators which are not computer controlled but controlled directly by the hand of a user.

### **Informative references**

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Manual manipulators	3C007/BS29
Structures and purposes of manual manipulators	3C007/XF00

## B25J 1/02

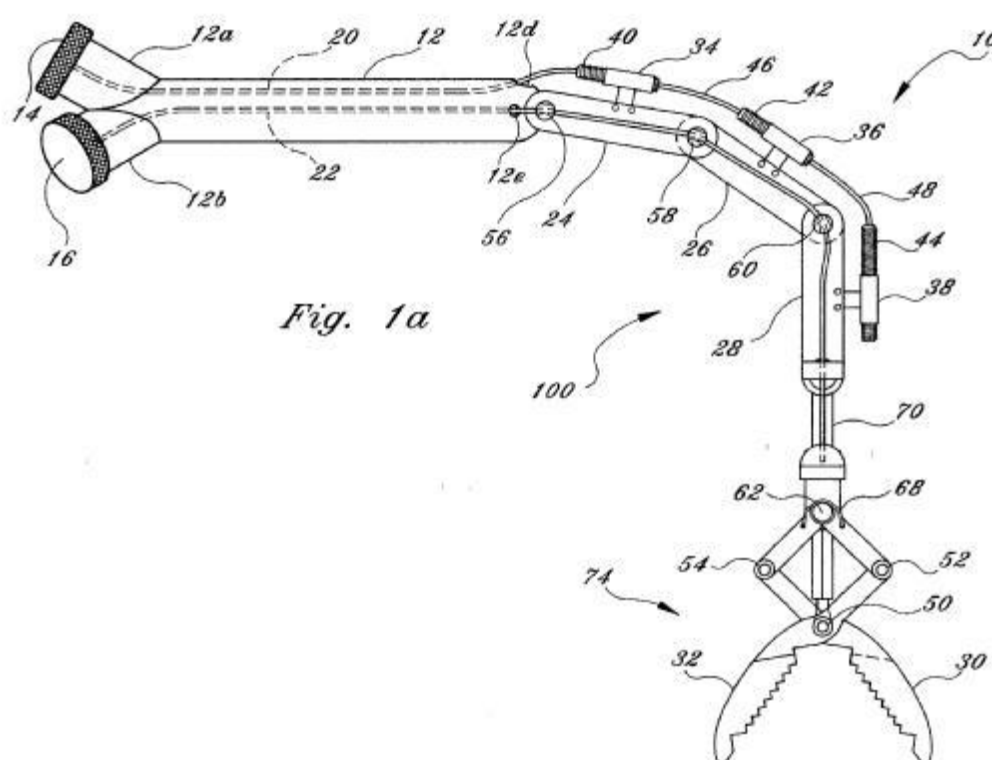
### articulated or flexible

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 1/02](#)

US 5647622



#### Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Manual manipulators having a joint	3C007/XF01
Flexible manual manipulators	3C007/XF02

## B25J 1/04

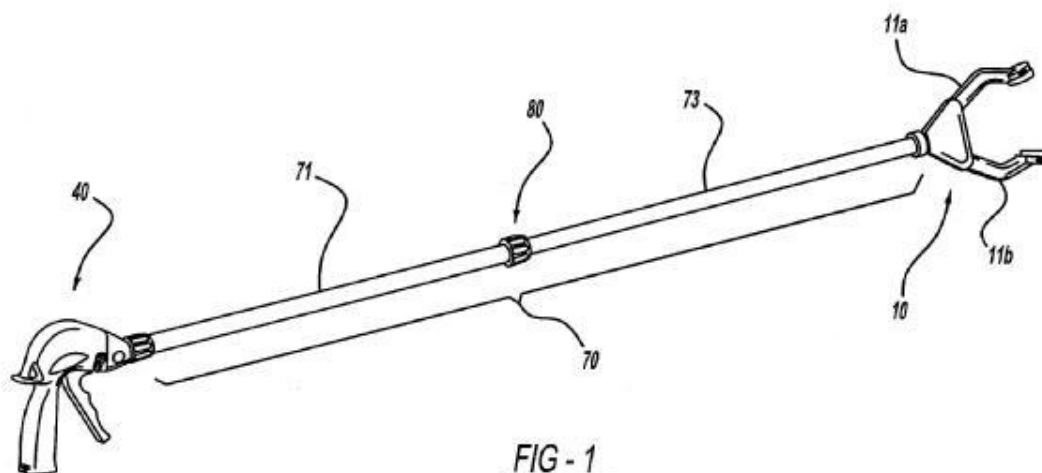
rigid, e.g. shelf-reachers [N: (without grippers A47F13/06)]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 1/04](#)

US 2010102583



### Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for picking apples or like fruits	<a href="#">A01D 46/24</a>
Reaching devices in a shop	<a href="#">A47F 13/06</a>
Pliers; Other hand-help gripping tools with jaws on pivoted limbs	<a href="#">B25B 7/00</a>

Hand-held gripping tools other than those covered by group <a href="#">B25B 7/00</a>	<a href="#">B25B 9/00</a>
Hand implements for removing undesirable matter, e.g. litter pickers	<a href="#">E01H 1/12</a>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Tool hands	3C007/XF05
Support hands	3C007/XF06

## **B25J 1/06**

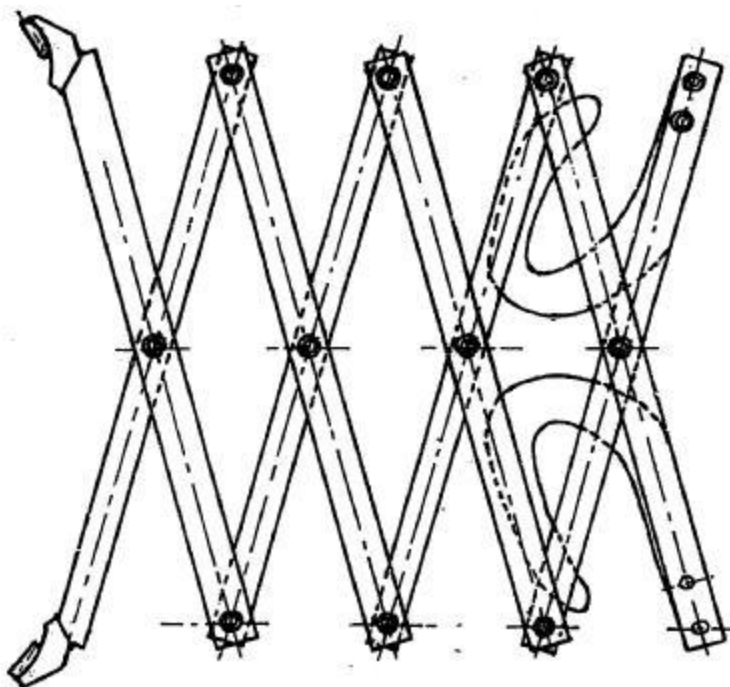
**of the lazy-tongs type**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 1/06](#)

DE 8901596 U



## B25J 1/08

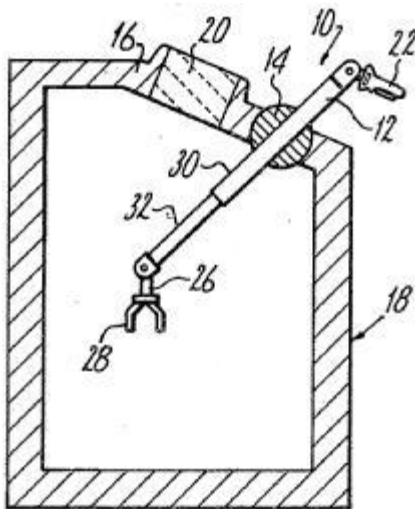
movably mounted in a wall

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 1/08](#)

FR 2542658



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Shielded cells or rooms in structural combination with remotely controlled apparatus, e.g. with manipulators	<a href="#">G21F 7/06</a>
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### Special rules of classification within this group

Manipulators of master-slave type should additionally be classified in [B25J 3/02](#).

### Synonyms and Keywords

In patent documents the following expression/word "telem manipulator" is often used.

## B25J 1/10

### Sleeve and pivot mountings therefor

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 1/10](#)

FR 1266572

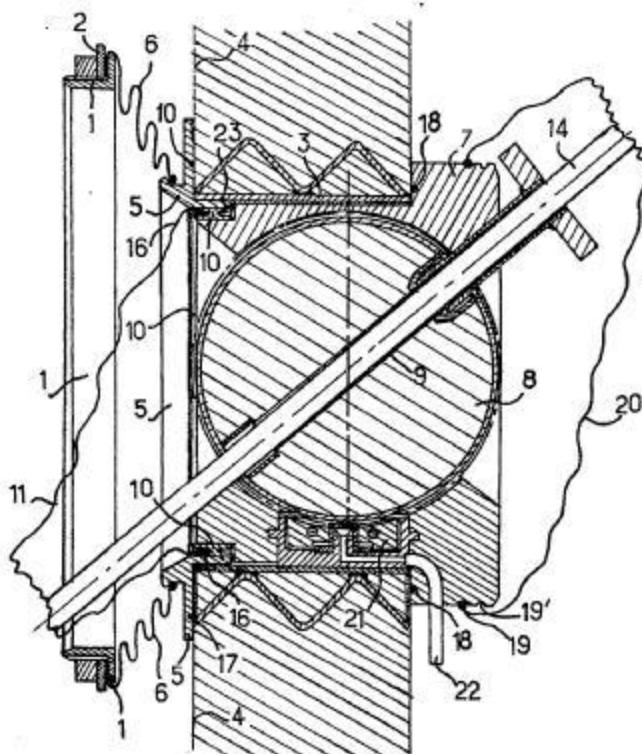


Fig. 4

## B25J 1/12

### having means for attachment to a support stand

#### Definition statement

*This subclass/group covers:*

Manipulators which are moved in space by hand and which are attached to the ground or the ceiling.

DE 102008013729





WO 9718927



Manual master-slave manipulators mounted in a wall	<a href="#">B25J 1/08</a>
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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

10

## B25J 3/04

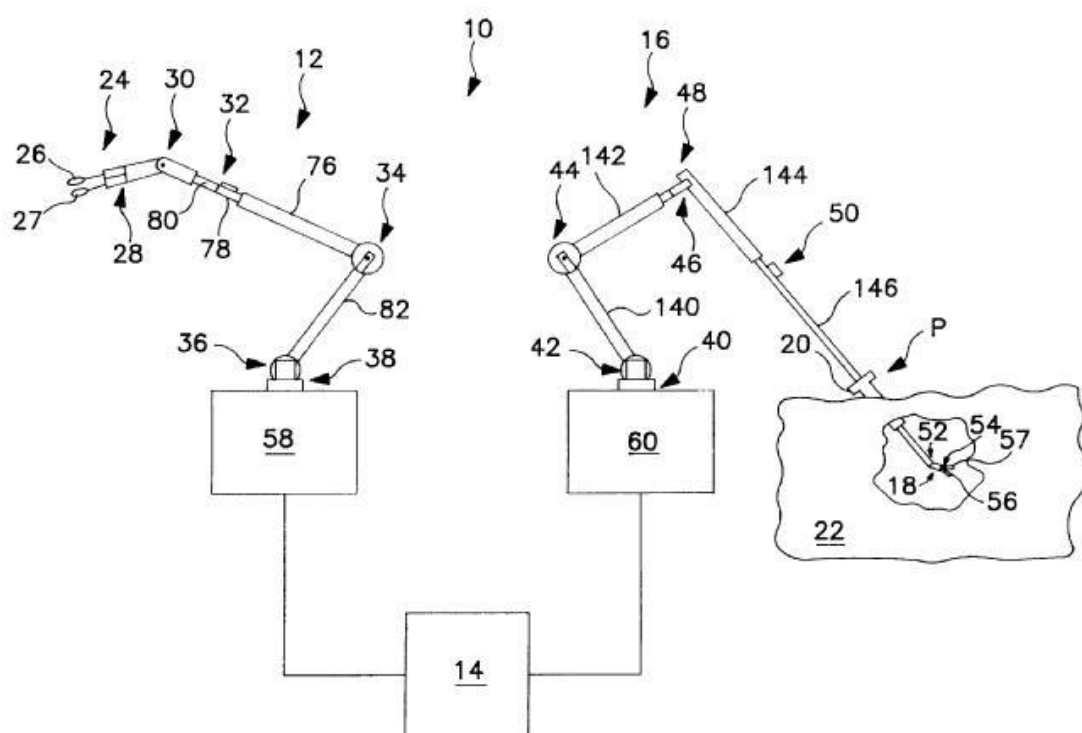
involving servo mechanisms (servo-actuated heads  
B25J15/02)

### Definition statement

*This subclass/group covers:*

Master-slave manipulators having an electrical connection between the master unit and the slave unit (i.e. the movements of the master unit are transformed into electrical signals for controlling actuators of the slave unit).

US 6197017



### References relevant to classification in this group

*This subclass/group does not cover:*

Master part in the form of hand-grip control means	<a href="#">B25J 13/02</a>
Control systems of master-slave manipulators	<a href="#">B25J 9/1689</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Manipulators specially adapted for use in surgery	<a href="#">A61B 19/00M</a>
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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Control bars electrically connected to slave parts	3C007/JT04
Having reaction force sensing functions	3C007/JT05
Correspondence relationships between main parts and slave parts changeable	3C007/JT06
Having additional setting functions	3C007/JT07
Providing manipulators per se as control bars	3C007/JT09
Realization or copying human motions	3C007/JT10

## **B25J 5/00**

**Manipulators mounted on wheels or on carriages (B25J1/00 takes precedence; programme-controlled manipulators B25J9/00; [N: vehicle aspects B60, B62, e.g. remote-controlled steering for motor vehicles B62D1/24; control of position of vehicles G05D1/00])**

### **Definition statement**

*This subclass/group covers:*

Mobile manipulators, meant to work at different locations.

### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Walking robots	<a href="#">B62D 57/032</a>
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## B25J 5/005

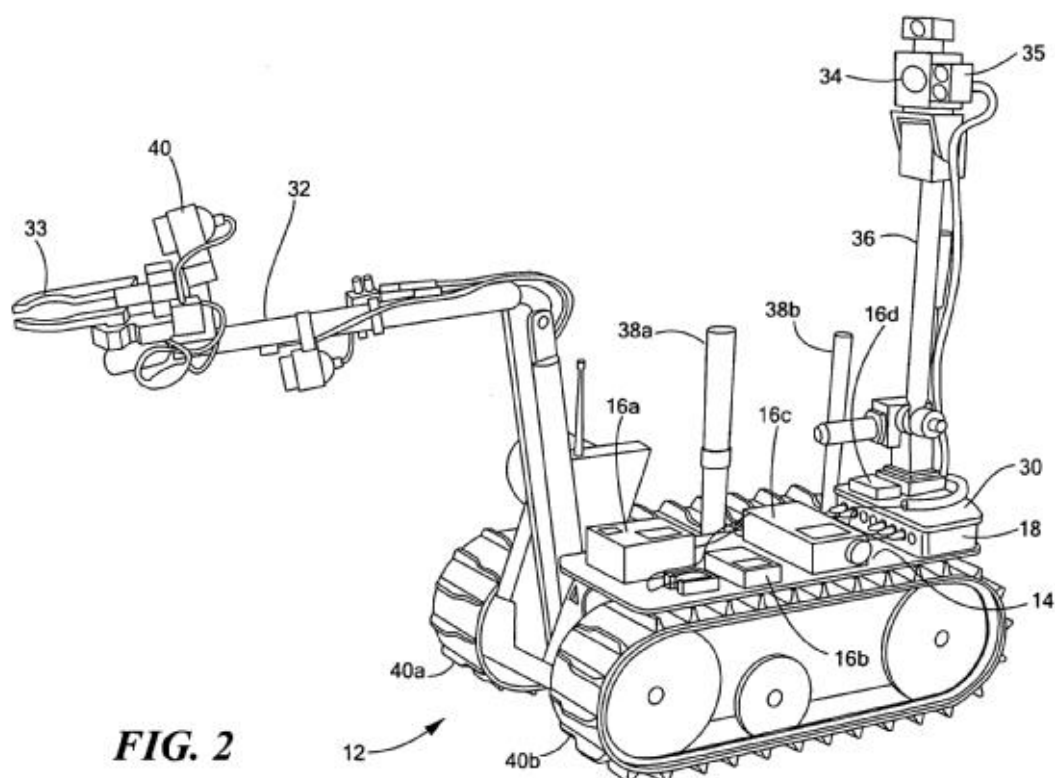
[N: mounted on endless tracks or belts]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 5/005](#)

US 2009095096



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Endless track vehicles	<a href="#">B62D 55/00</a>
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Attention is drawn to the following Terms (Japanese classification scheme), which may be of interest for search:

Crawlers	3C007/WA17
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## Synonyms and Keywords

In patent documents the following expressions/words (DE)"raupenkette", "gleiskette" and (FR)"chenilles" are often used as synonyms.

## B25J 5/007

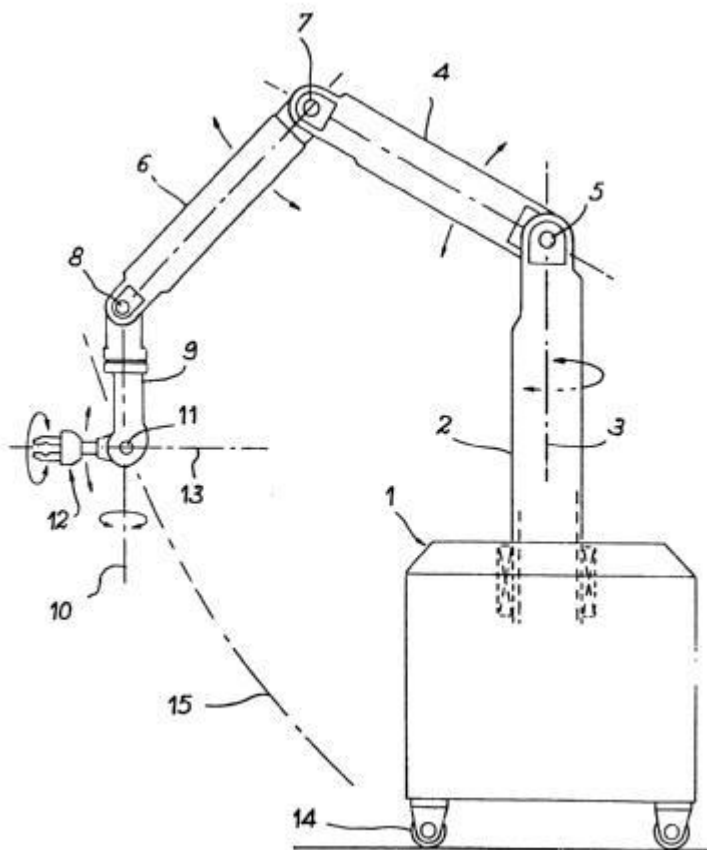
[N: mounted on wheels]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 5/007](#)

EP 0008981



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Vacuum cleaners	<a href="#">A47L</a>
Control of land vehicles	<a href="#">G05D 1/021</a>

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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Wheel-type autonomous robots	3C007/WA16
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### **Special rules of classification within this group**

Home robots should additionally be classified in [B25J 9/0003](#).

### **B25J 5/02**

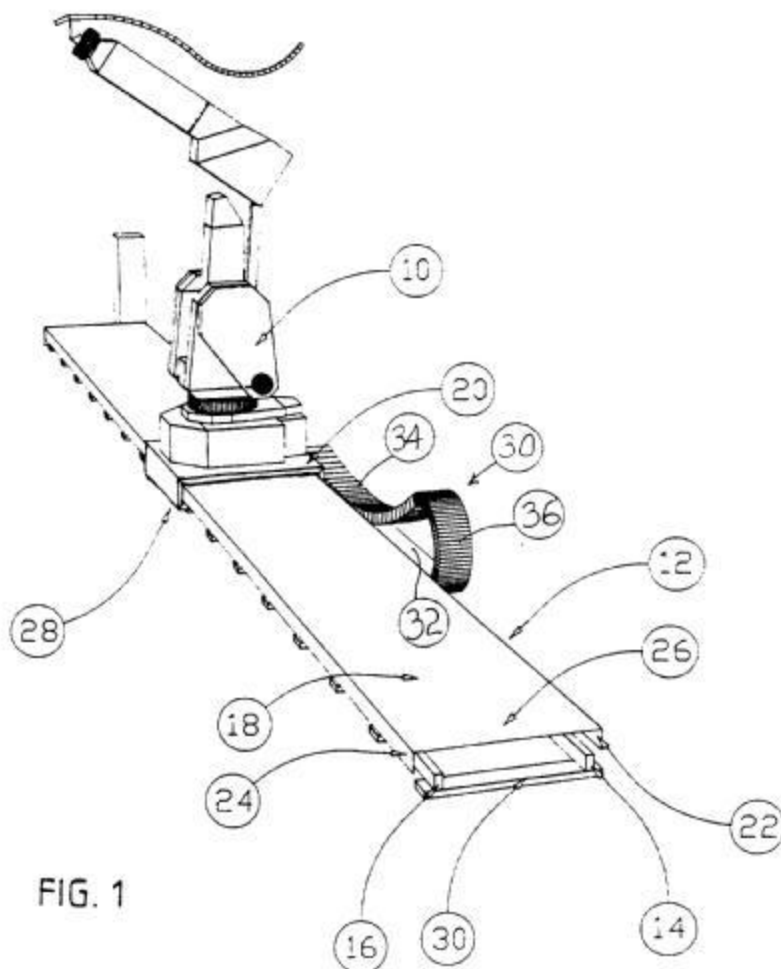
**travelling along a guideway**

#### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 5/02](#)

EP 0705665



## References relevant to classification in this group

*This subclass/group does not cover:*

Cartesian coordinate type manipulators	<a href="#">B25J 9/023</a>
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## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Robot base travelling along a track	3C007/CS01
Autonomous robot moving on a track	3C007/WA20



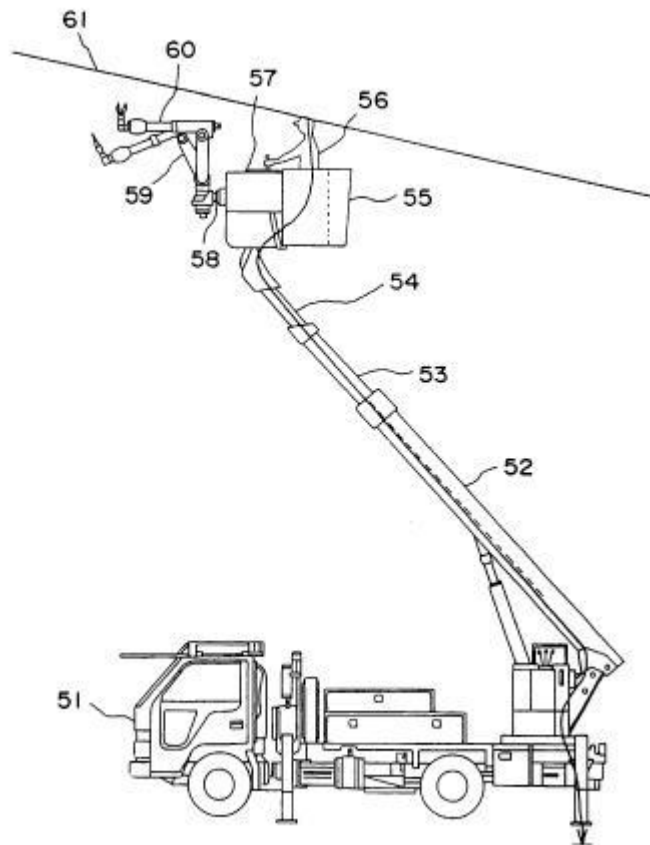


## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 5/06](#)

EP 0940366



## B25J 7/00

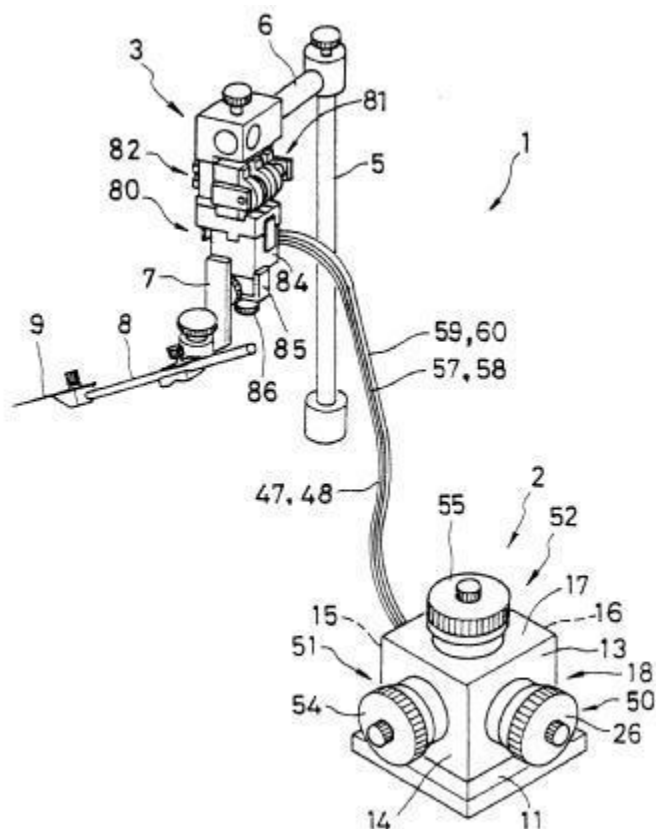
**Micromanipulators [N: (specimen supports for investigating or analysing materials G01N23/2204; associated with microscopes G02B21/32; means for supporting or positioning the objects or the material in discharge tubes H01J37/20)]**

## Definition statement

*This subclass/group covers:*

Manipulators performing tasks at a level of precision that can usually not be achieved by the unaided human hand.

EP 0906813



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Micro-structural devices or systems	<a href="#">B81B</a>
Nano-structures	<a href="#">B82B</a>
Piezo-electric devices	<a href="#">H01L 41/00</a>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Micromanipulators	3C007/BS30
Structure / purpose of micromanipulators	3C007/XG00

## B25J 9/00

### Programme-controlled manipulators

## Definition statement

*This subclass/group covers:*

Manipulators performing a series of actions corresponding to a list of instructions.

## B25J 9/0003

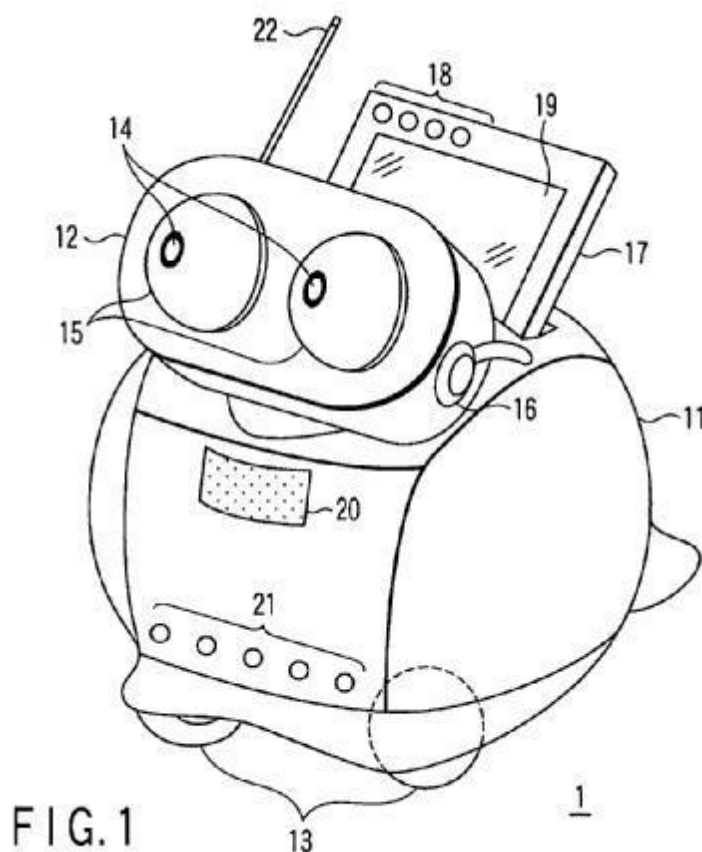
[N: Home robots, i.e. small robots for domestic use]

## Definition statement

*This subclass/group covers:*

Robots which operates semi- or fully autonomously to perform services useful to the well-being of humans and equipment, excluding manufacturing operations.

US 2005091684



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Vacuum cleaners	<a href="#">A47L</a>
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Control of land vehicles	<a href="#">G05D 1/021</a>
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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Robots for service	3C007/AS34
Robots for medical treatment	3C007/AS35
Robots for entertainment	3C007/AS36

### **Special rules of classification within this group**

Home robots mounted on wheels or tracks should additionally be classified in [B25J 5/00](#).

### **Synonyms and Keywords**

In patent documents the following expressions/words "service robots", and "domestic robots" are often used as synonyms.

## **B25J 9/0006**

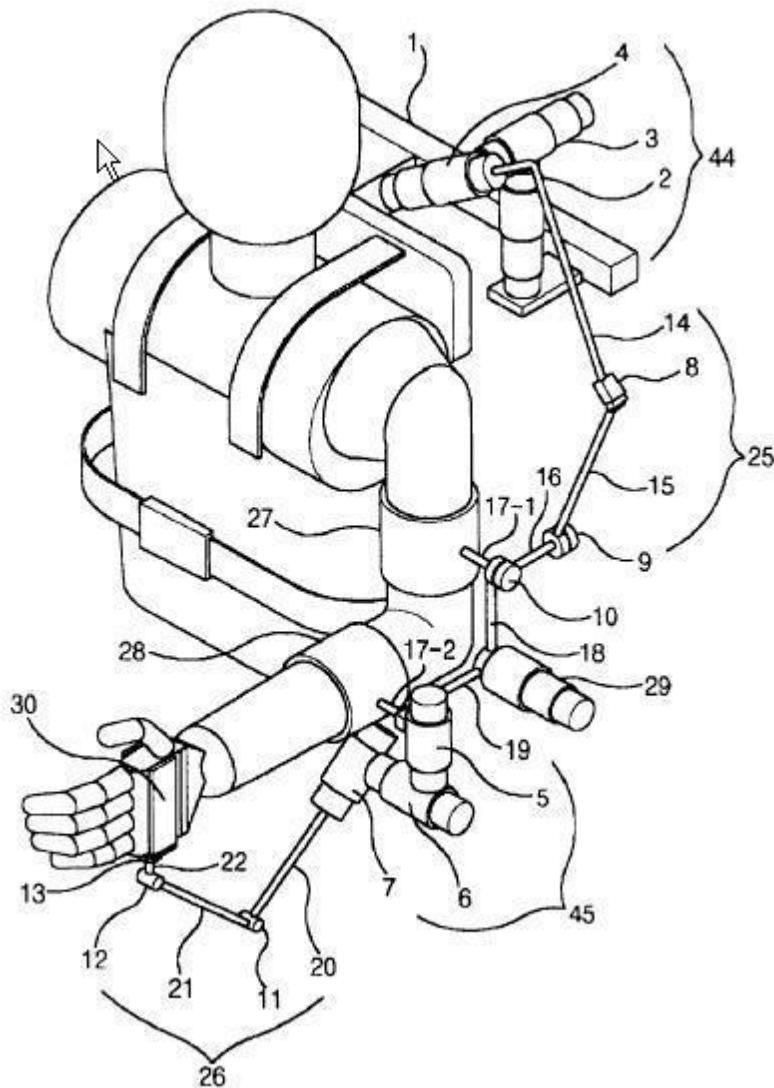
**[N: Exoskeletons, i.e. resembling a human figure]**

### **Definition statement**

*This subclass/group covers:*

Powered mobile machines consisting primarily of a skeleton-like framework worn by a person and a power supply that supplies at least part of the activation-energy for limb movement (Wikipedia).

US 6301526



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Orthopaedic devices specially adapted for correcting deformities of the limbs or for supporting them	<a href="#">A61F 5/0102</a>
Apparatus for passive stretching or bending of the lower limbs	<a href="#">A61H 1/0237</a>
Apparatus for passive stretching or bending of the upper limbs	<a href="#">A61H 1/0274</a>
Suspension devices for supporting the body of disabled persons in an upright walking or standing position	<a href="#">A61H 3/00</a>

Walking robots	<a href="#">B62D 57/032</a>
Input/output arrangements in interaction with the human body for transferring data to be processed	<a href="#">G06F 3/00B8</a>

## **B25J 9/0009**

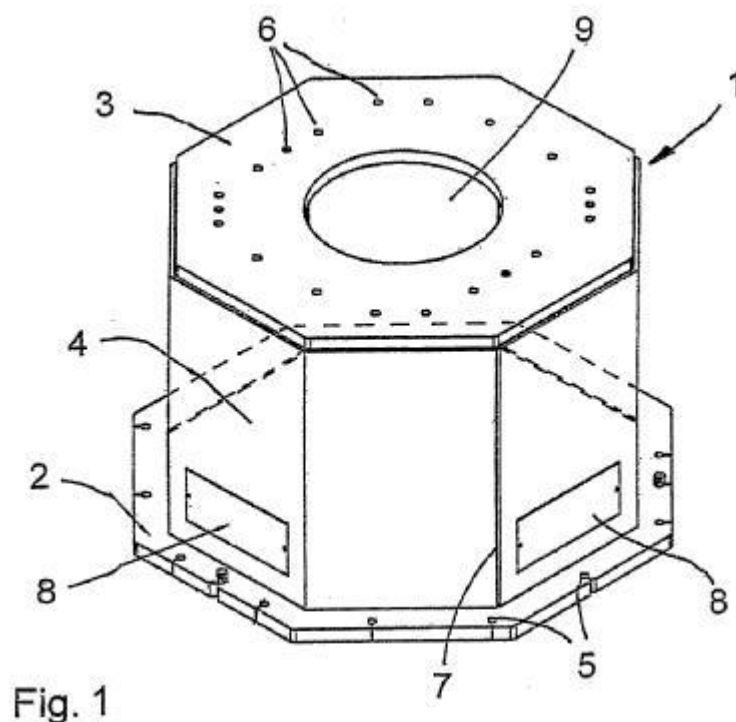
**[N: Constructional details, e.g. manipulator supports, bases]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/0009](#)

WO 03031125



## **B25J 9/0012**

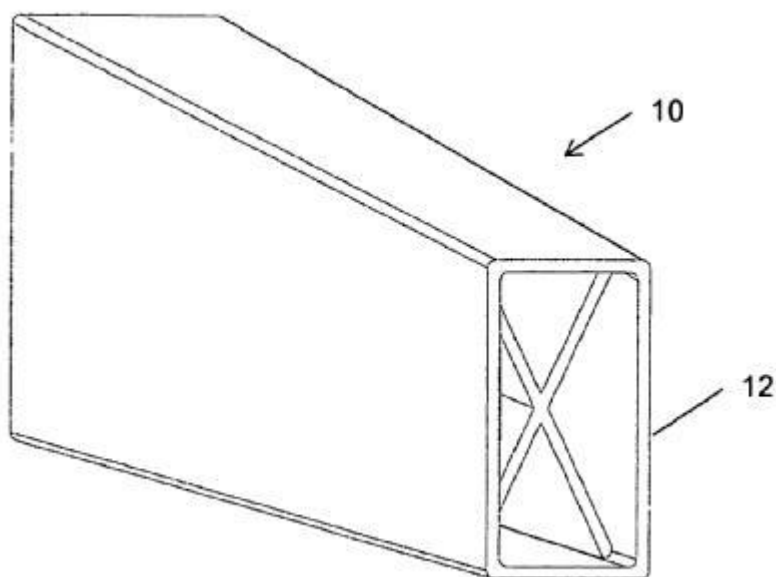
**[N: making use of synthetic construction materials, e.g. plastics, composites]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/0012](#)

US 2010304097



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Material to form an arm	3C007/CU01
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### B25J 9/0081

[N: with master teach-in means]

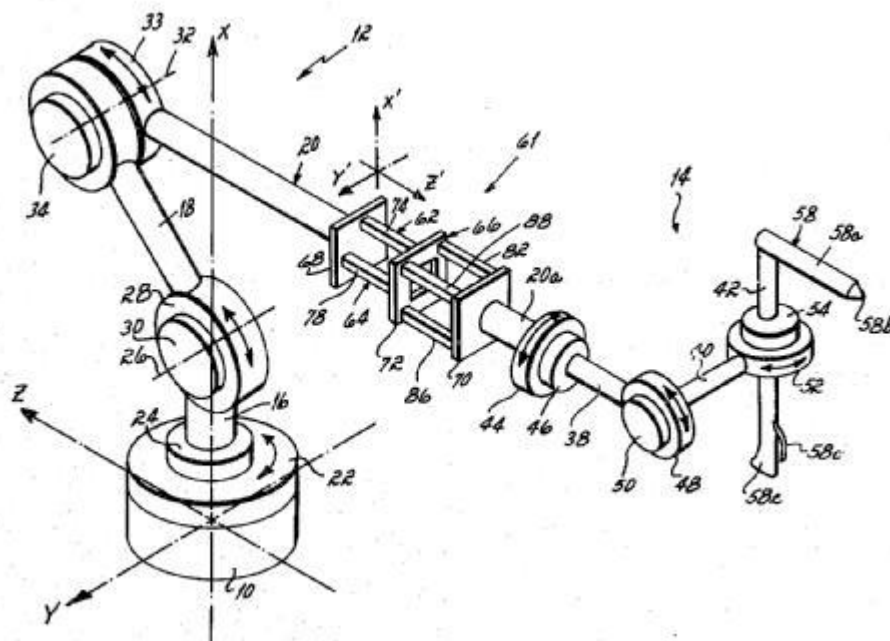
### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/0081](#)

US 4283764





## Informative references

Attention is drawn to the following places, which may be of interest for search:

Teaching successive positions by walk-through, i.e. the tool head or end effector being grasped and guided directly to follow a path	<a href="#">G05B 19/423</a>
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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Teaching auxiliary tool	3C007/JU07
Mount hand	3C007/JU08
Teaching by man power	3C007/LS02

## B25J 9/0084

[N: comprising a plurality of manipulators]

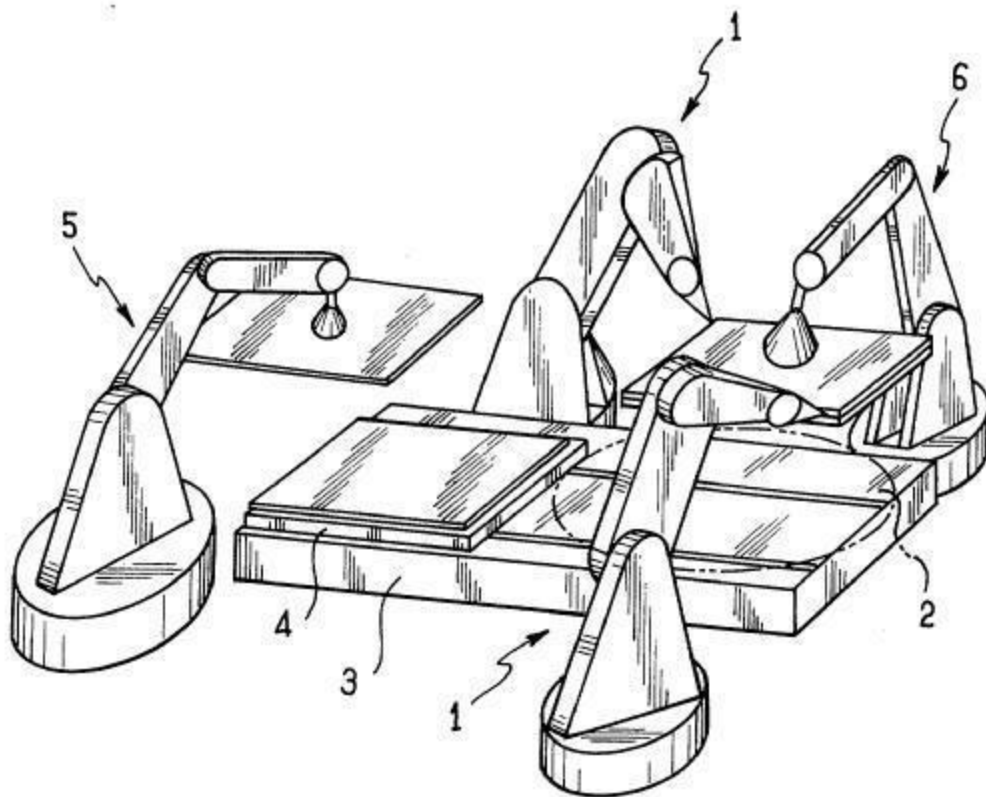
## Definition statement

This subclass/group covers:

Both robotic installation comprising several manipulators and manipulators

comprising two arms connected to a single basis.

FR 2874190



### References relevant to classification in this group

*This subclass/group does not cover:*

Humanoid robots having two arms (mostly in)	<a href="#">B62D 57/032</a>
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### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

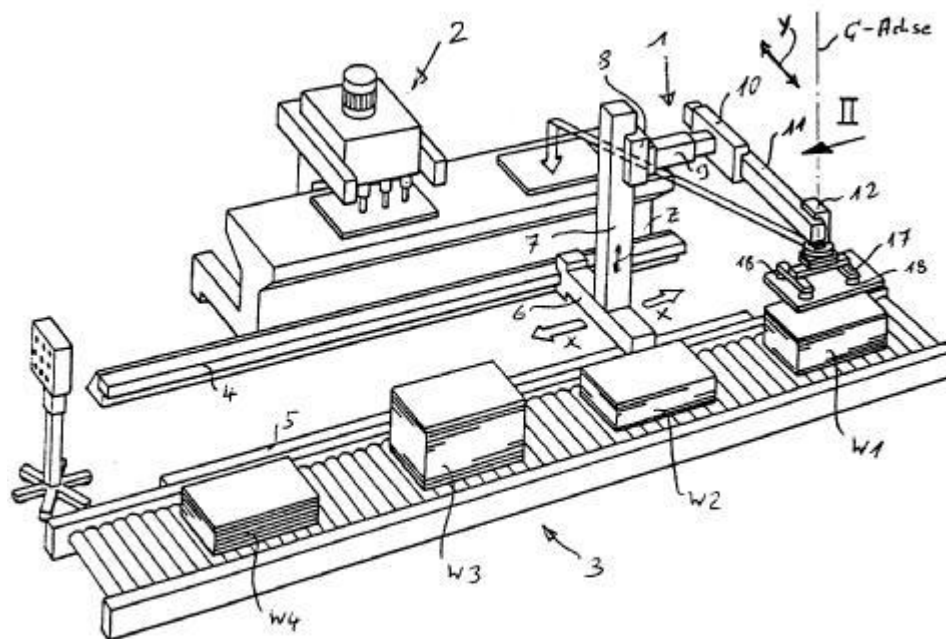
Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Double-arm manipulator	3C007/BS26
Control device related to peripheral device such as other robot	3C007/JS02
Cooperation among manipulators	3C007/LV02

**[N: co-operating with conveyer means]**

*This subclass/group covers:*

EP 0512126



*Attention is drawn to the following places, which may be of interest for search:*

Programme-control systems consisting of manipulators and conveyer only	<a href="#"><u>G05B 19/4182</u></a>
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Work object movable by conveyer	3C007/NS02
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## B25J 9/0096

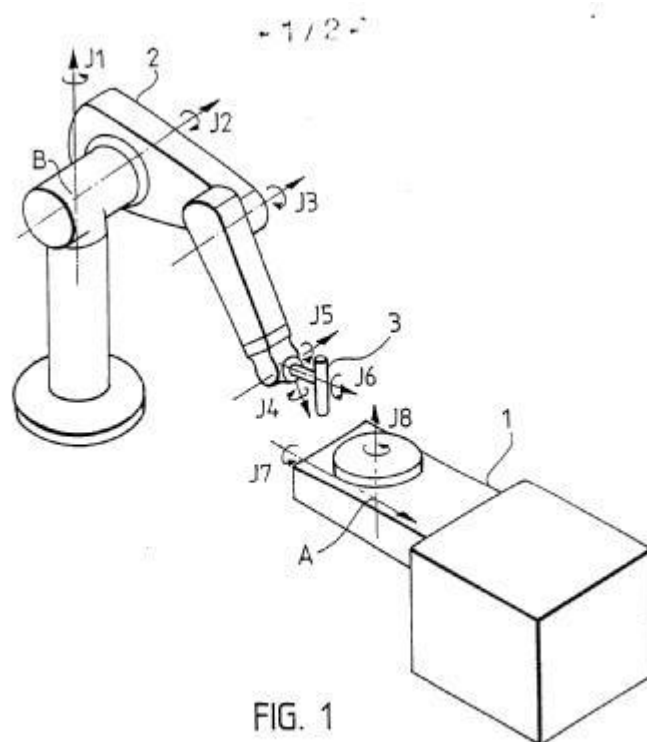
[N: co-operating with a working support, e.g. work-table]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/0096](#)

WO 9104522



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Work object movable by rotation/oscillating base	3C007/NS03
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## B25J 9/02

**characterised by movement of the arms, e.g. cartesian coordinate type (B25J9/06 takes precedence)**

**Definition statement**

*This subclass/group covers:*

The main types of industrial manipulators, each type corresponding to a specific kinematic chain.

**B25J 9/023**

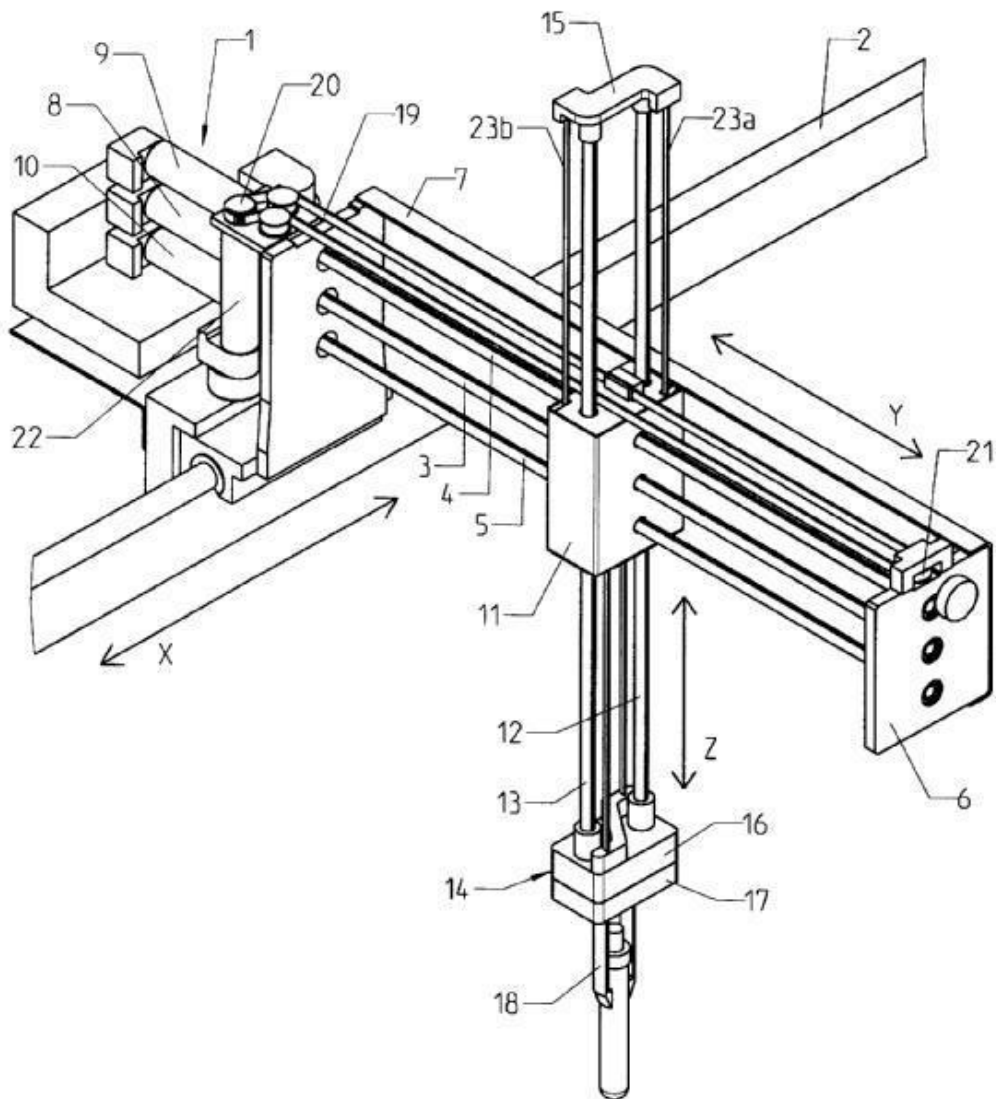
**[N: Cartesian coordinate type]**

**Definition statement**

*This subclass/group covers:*

Manipulators consisting of prismatic joints connected in series and allowing movements along perpendicular axis.

US 6264419



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Movable work or tool support with a single sliding pair followed perpendicularly by a single sliding pair	<a href="#">B23Q 1/621</a>
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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Cartesian coordinates robots with two degrees of freedom	3C007/BS02
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Cartesian coordinates robots with three degrees of freedom	3C007/BS03
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## B25J 9/026

### [N: Gantry-type]

#### Definition statement

*This subclass/group covers:*

Cartesian coordinate type manipulators having three prismatic joints, wherein one joint is formed by a carriage running on an overhead horizontal beam supported at its two ends by other beams.

GB2179322

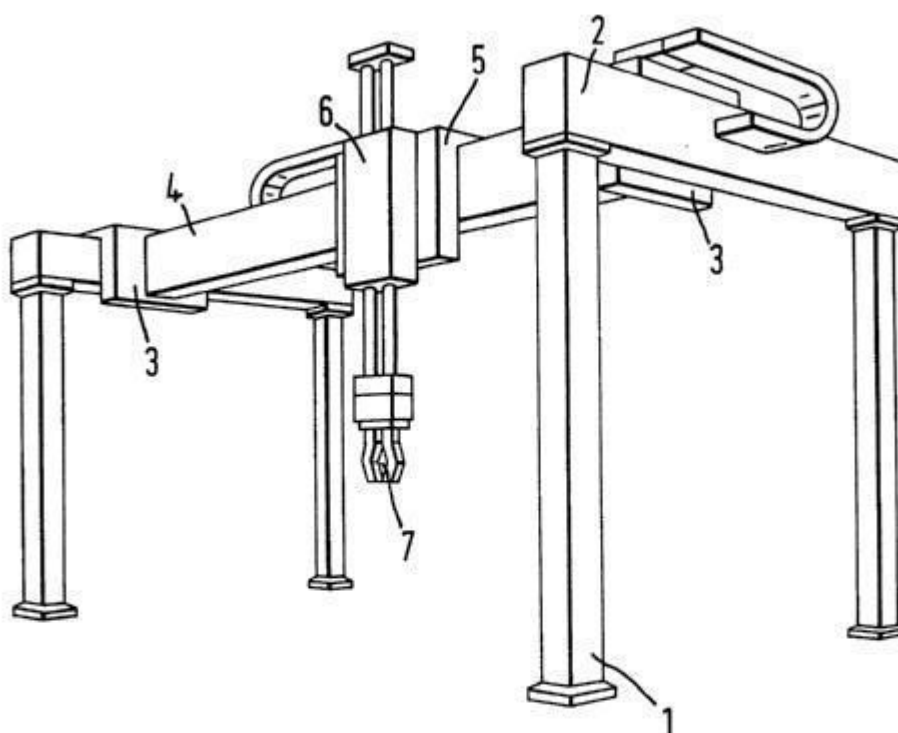


FIG. 1

#### References relevant to classification in this group

*This subclass/group does not cover:*

Examples of places where the subject matter of this group is covered when specially adapted, used for particular purpose, or incorporated in a larger system:

Manipulators travelling along a guideway, wherein the guideway is also moved (details concerning the guideways/rails should also be classified here)	<a href="#">B25J 5/04</a>
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## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Portals	<a href="#">B23Q 1/012</a>
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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Gantry type robots	3C007/BS05
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## Synonyms and Keywords

In patent documents the following expressions/words (FR)"robot portique", and (DE)"portalroboter " are often used as synonyms.

## B25J 9/04

**by rotating at least one arm, excluding the head movement itself, e.g. cylindrical coordinate type or polar coordinate type**

## Definition statement

*This subclass/group covers:*

Manipulators having a kinematic chain (excluding the kinematic pairs of the head itself) including at least one revolute joint.

## B25J 9/041

**[N: Cylindrical coordinate type]**

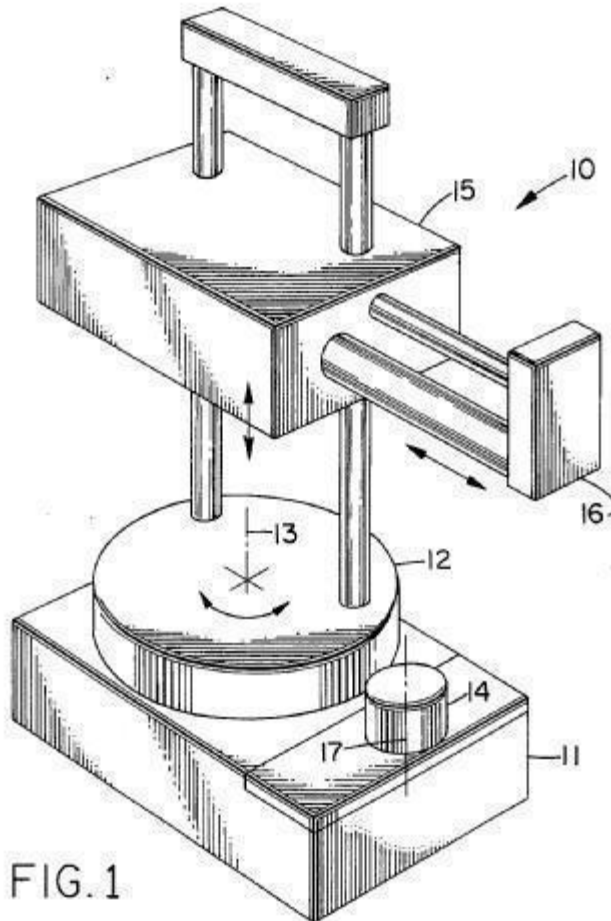
## Definition statement



*This subclass/group covers:*

Manipulators having a kinematic chain including at least a revolute joint and arranged so that the working envelope of the manipulator is a cylinder. The kinematic chain usually includes a revolute joint having a vertical axis and two prismatic joints having respectively a vertical and a horizontal axis.

US4642212



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Cylindrical coordinates robots	3C007/BS06
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**B25J 9/042**

**[N: comprising an articulated arm]**

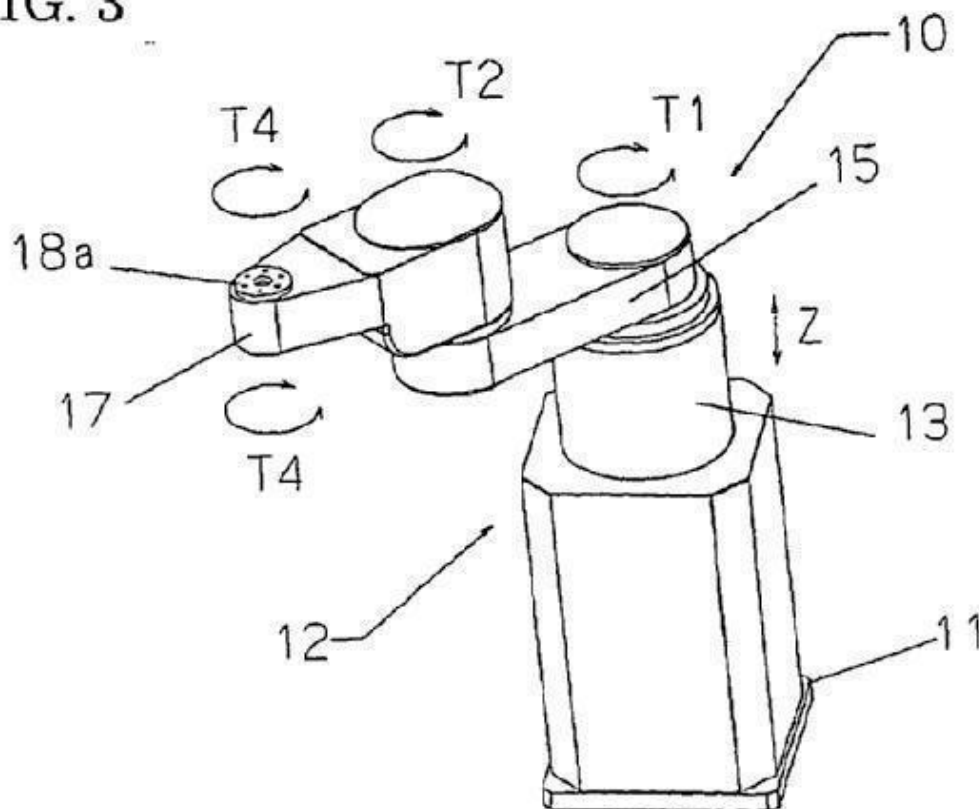
## Definition statement

*This subclass/group covers:*

Cylindrical coordinate type manipulators having at least two subsequent revolute pairs having parallel axes.

EP 1671755

FIG. 3



## References relevant to classification in this group

*This subclass/group does not cover:*

Transfer devices for transferring semiconductors into an out of processing chambers	<a href="#">H01L 21/67742</a>
Apparatus specially adapted for handling semiconductor, the wafer being placed on a robot blade, or gripped for conveyance	<a href="#">H01L 21/68707</a>

## Informative references

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

## Synonyms and Keywords

SCARA	Selective Compliance Assembly Robot Arm
-------	--

**B25J 9/045**

**[N: Polar coordinate type]**

## Definition statement

Manipulators having a kinematic chain comprising two revolute joints and a prismatic joint arranged so that the working envelope of the manipulator is a part of a sphere.

## Informative references

35

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Polar coordinates robots	3C007/BS07
--------------------------	------------

### **Synonyms and Keywords**

In patent documents the following expression/word "spherical" is often used.

### **B25J 9/046**

#### **[N: Revolute coordinate type]**

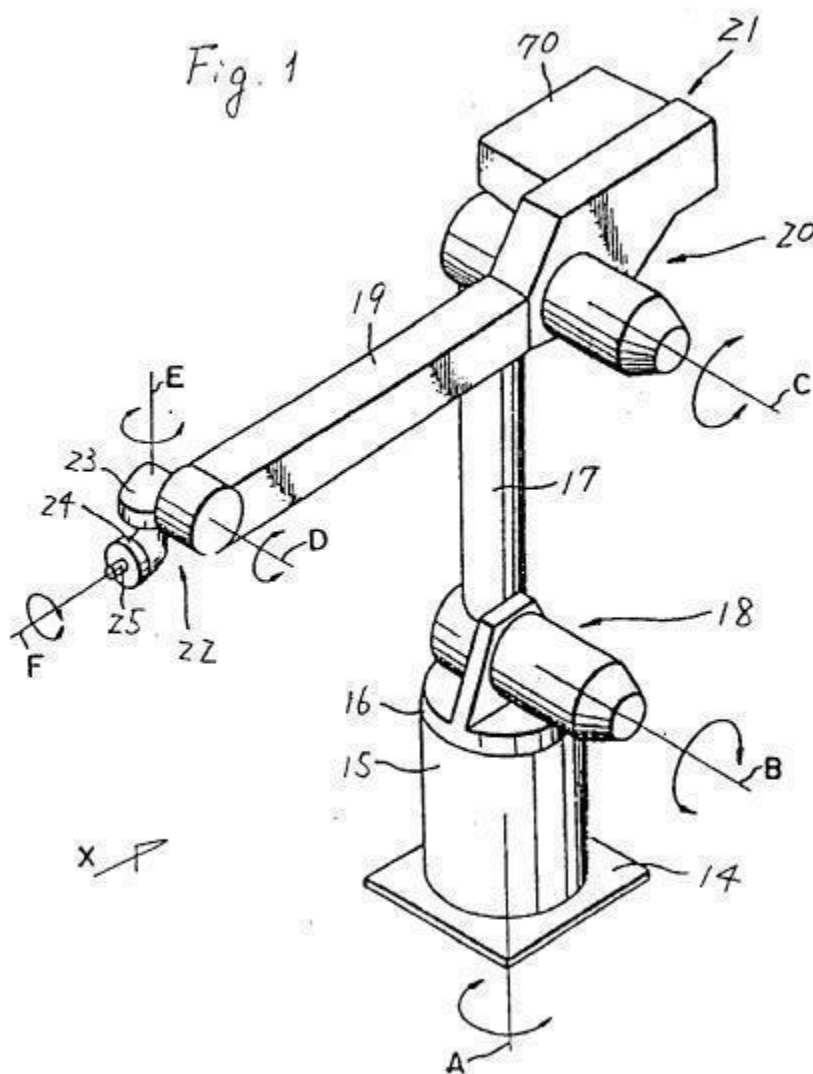
#### **Definition statement**

*This subclass/group covers:*

Manipulators having a kinematic chain including at least two subsequent revolute joints having parallel horizontal axis.

The most common revolute coordinate type manipulators have six revolute joints: a first joint having a vertical axis between a basis and a carrousel, a second joint between the carrousel and a lower arm, a third joint between the lower arm and an upper arm, the second and third joint shaving parallel horizontal axis and three further joints for the wrist.

DE 3939836



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Vertically articulated robots	3C007/BS10
With five degrees of freedom	3C007/BS11
With six degrees of freedom	3C007/BS12
With seven degrees of freedom	3C007/BS13
With eight or more degrees of freedom	3C007/BS14

---

## Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

Anthropomorphic	designates manipulators having a kinematic chain similar to a human arm, i.e. two revolute joints for the shoulder, two revolute joints for the elbow and three revolute joints for the wrist.
-----------------	--

## Synonyms and Keywords

In patent documents the following expressions/words "articulated type", and "jointed type" are often used as synonyms.

## B25J 9/047

**[N: the pivoting axis of the first arm being offset to the vertical axis]**

## Definition statement

*This subclass/group covers:*

Revolute coordinate type manipulators having the axis of the second revolute joint -between the carrousel and the lower arm - being offset from the vertical axis of the first revolute joint - between the basis and the carrousel -.

DE 29711523 U



With eight or more degrees of freedom	3C007/BS14
---------------------------------------	------------

## B25J 9/048

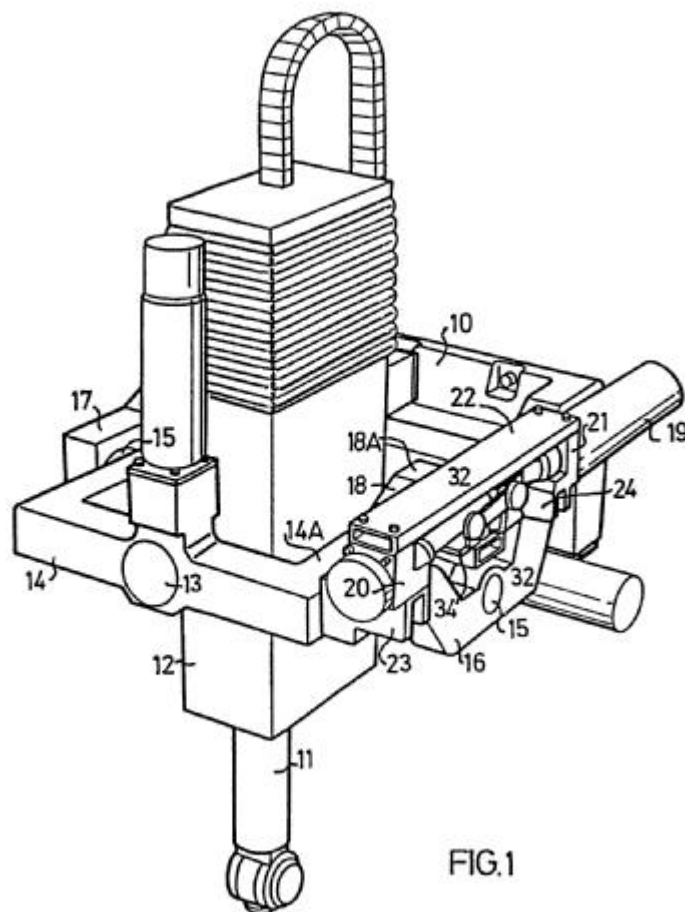
[N: Pendulum type]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/048](#)

EP 0162392



## B25J 9/06

characterised by multi-articulated arms

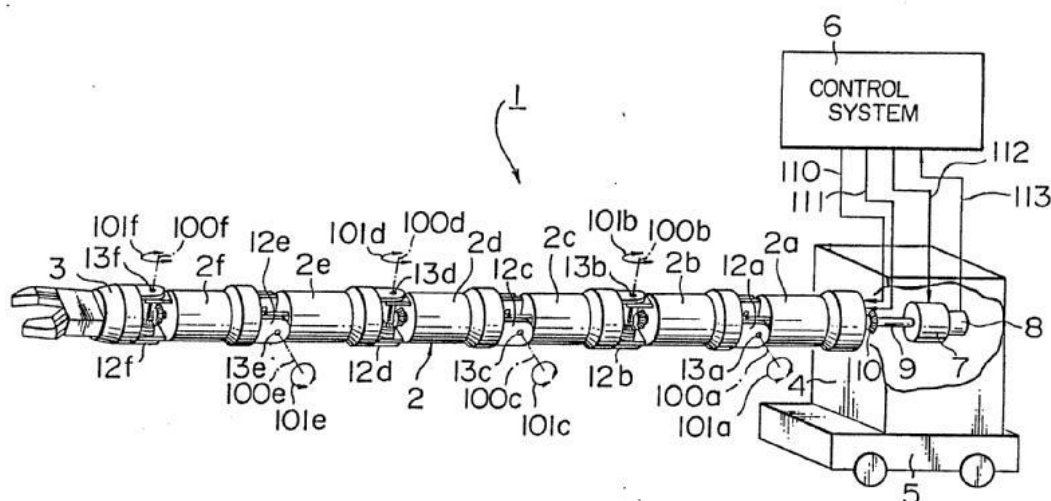


## Definition statement

*This subclass/group covers:*

Manipulator arms having multiple articulations placed in series.

EP0136719



## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Snake-shaped robots	3C007/BS17
---------------------	------------

## Special rules of classification within this group

Documents should additionally be classified in [B25J 18/06](#) when the number of articulations is very high and the articulations very closed to each other, because the robot arm can be considered as flexible.

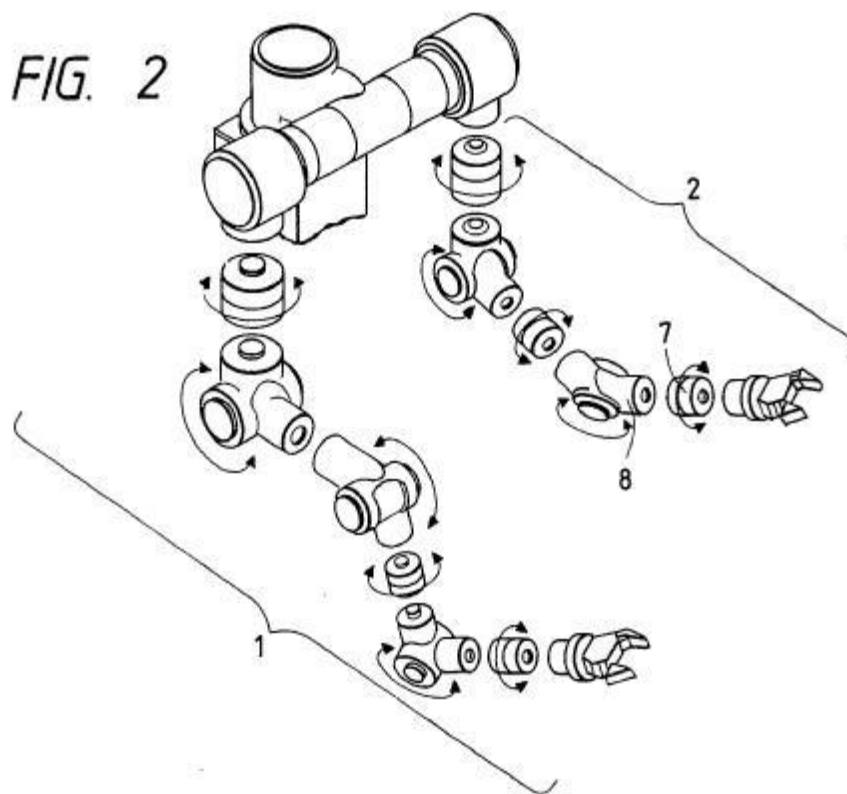
## B25J 9/08

**characterised by modular constructions**

## Definition statement

*This subclass/group covers:*

Manipulators which can be easily and quickly mounted / dismantled so that their components can be arranged in different possible configurations.



## B25J 9/10

characterised by positioning means for manipulator elements

### Definition statement

*This subclass/group covers:*

Constructional elements allowing the manipulators to perform their movement.

## B25J 9/1005

[N: comprising adjusting means]

### Definition statement

*This subclass/group covers:*

Constructional elements allowing to adjust the movement of the manipulators.

## B25J 9/101

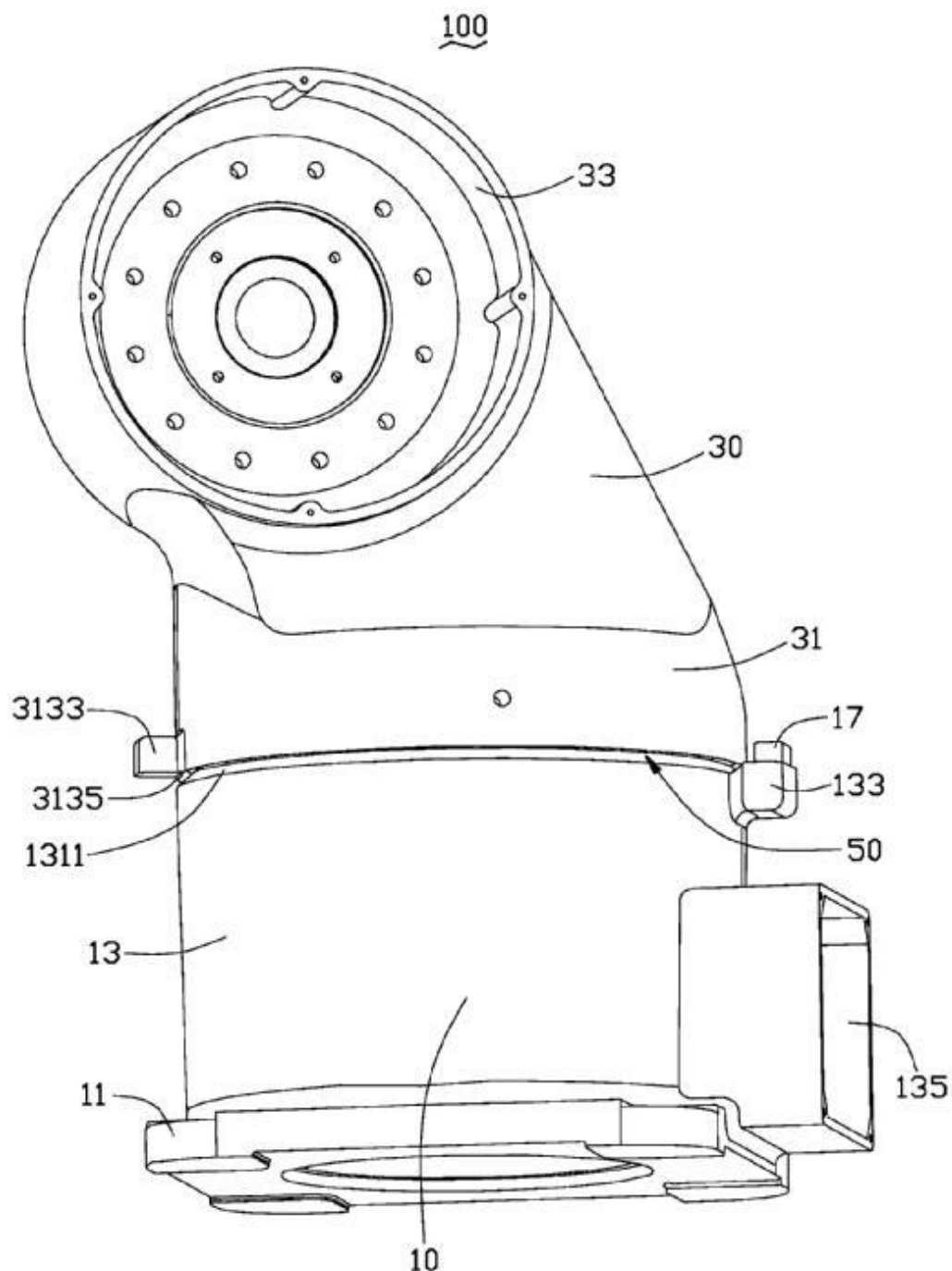
[N: using limit-switches, -stops]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/101](#).

US 20100178101



## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Means for preventing, limiting or returning the movements of parts of a control mechanism	<a href="#">G05G 5/04</a>
---	---------------------------

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Butting and stopping	3C007/CY13
----------------------	------------

## B25J 9/1015

[N: using additional, e.g. micro adjustment of the end effector]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1015](#)

EP 0149806

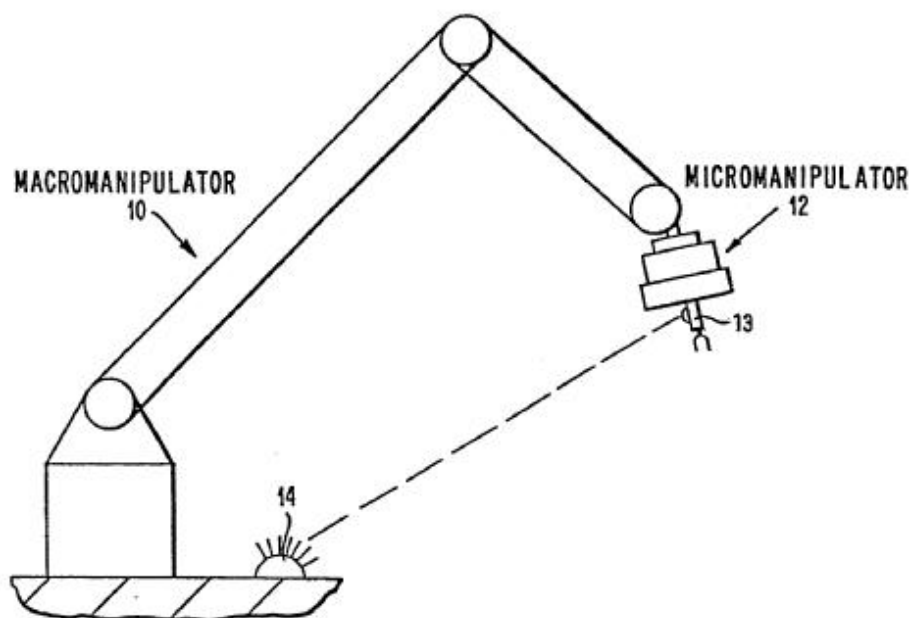


FIG. 1

## B25J 9/102

[N: Gears specially adapted therefor, e.g. reduction gears]

(gearings in general F16H)]

### Definition statement

*This subclass/group covers:*

Rotating elements for transmitting a torque specially adapted for manipulators.

## B25J 9/1025

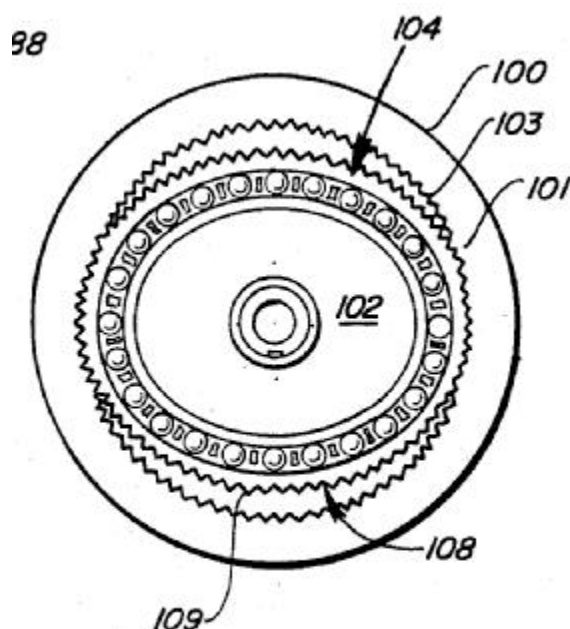
[N: Harmonic drives (in general: F16H49/001)]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1025](#)

US 4518308



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Harmonic reduction gears	3C007/HT26
--------------------------	------------

**B25J 9/103**

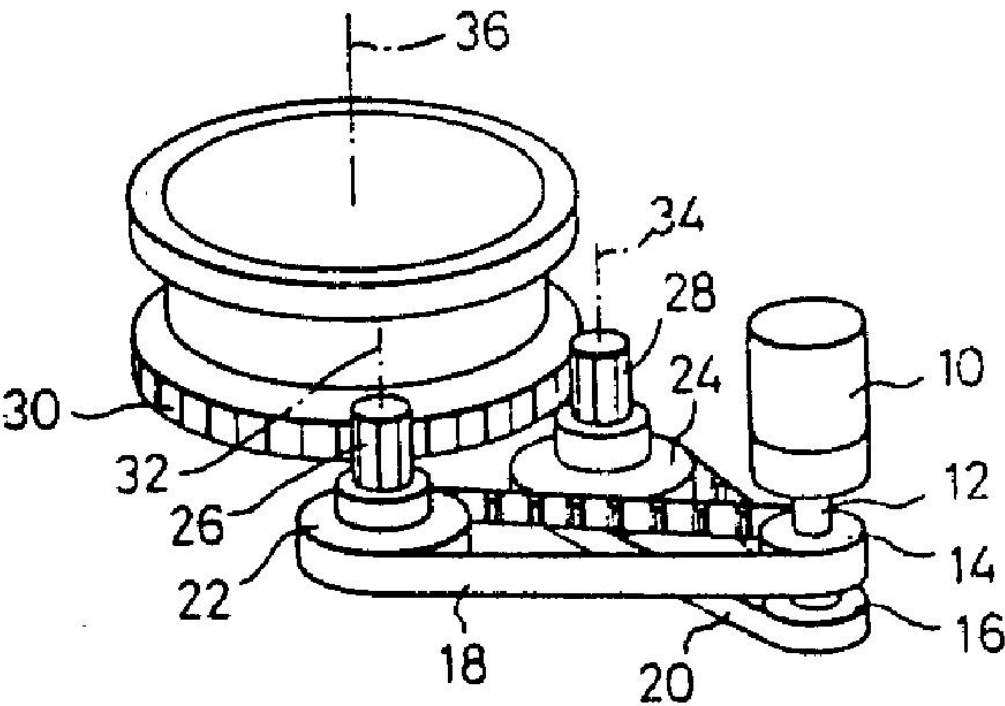
[N: with backlash-preventing means]

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/103](#)

JP 63023064



**Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Special devices for taking up backlash in toothed wheels	<a href="#">F16H 55/18</a>
Arrangements for adjusting or for taking-up backlash not provided for elsewhere	<a href="#">F16H 57/12</a>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Back-lash prevention	3C007/HT31
----------------------	------------

## Synonyms and Keywords

In patent documents the following expression/word "play" is often used.

## B25J 9/1035

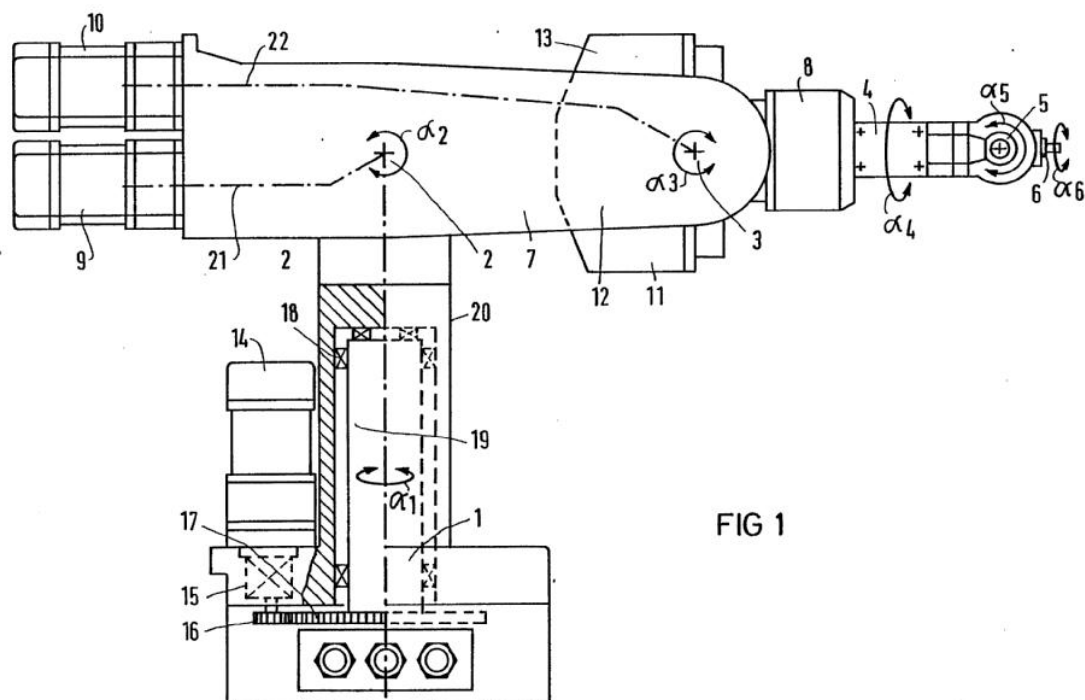
[N: Pinion and fixed rack drivers, e.g. for rotating an upper arm support on the robot base]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1035](#)

EP 0218075



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Gearings for conveying or interconverting oscillating or reciprocating motions comprising a rack	<a href="#">F16H 19/00B1</a>
--	------------------------------

Racks	<a href="#">F16H 55/26</a>
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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Rack and pinion	3C007/HT22
-----------------	------------

## **B25J 9/104**

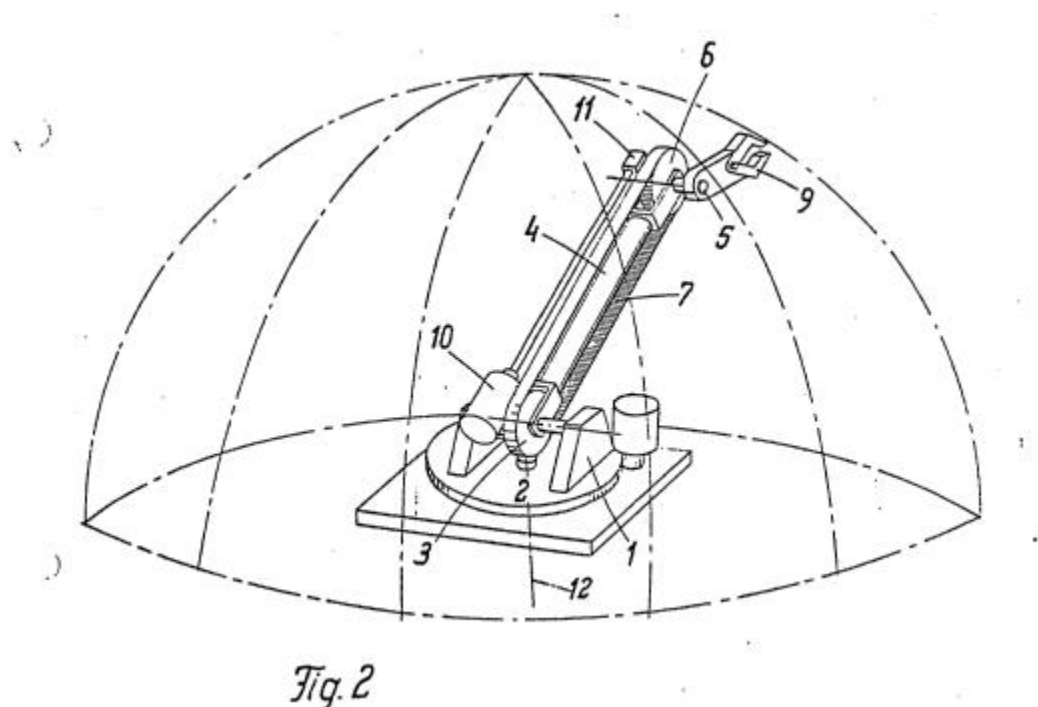
**[N: with cables, chains or ribbons]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/104](#)

EP 0076947



### **Informative references**

*Attention is drawn to the following places, which may be of interest for search:*

Gearings for conveying rotary motion by endless flexible members	<a href="#">F16H 7/00</a>
--	---------------------------



Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Flexible transmission member	3C007/HT01
Belt	3C007/HT02
Chain	3C007/HT03
Rope / Wire	3C007/HT04

## B25J 9/1045

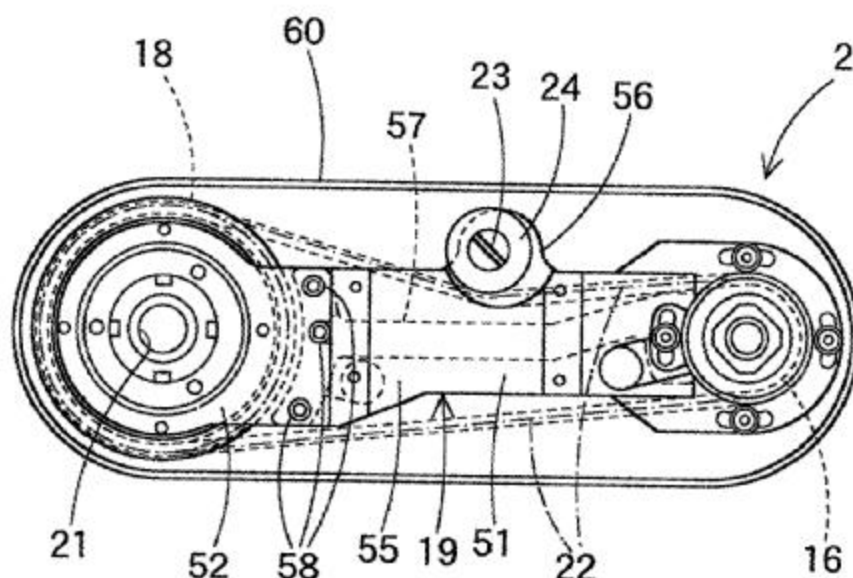
[N: comprising tensioning means]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1045](#)

US 2002148320



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Adjust tension	3C007/HT07
----------------	------------

## B25J 9/105

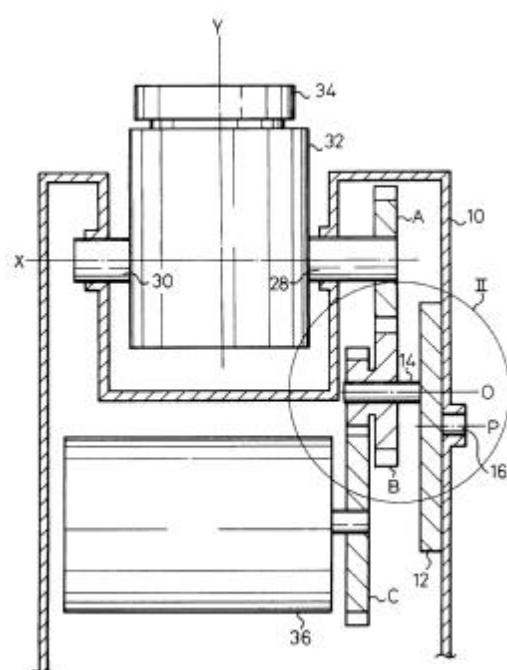
[N: using eccentric means (B25J9/109 takes precedence)]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/105](#)

EP 0638397



## B25J 9/1055

[N: by gravity]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1055](#)

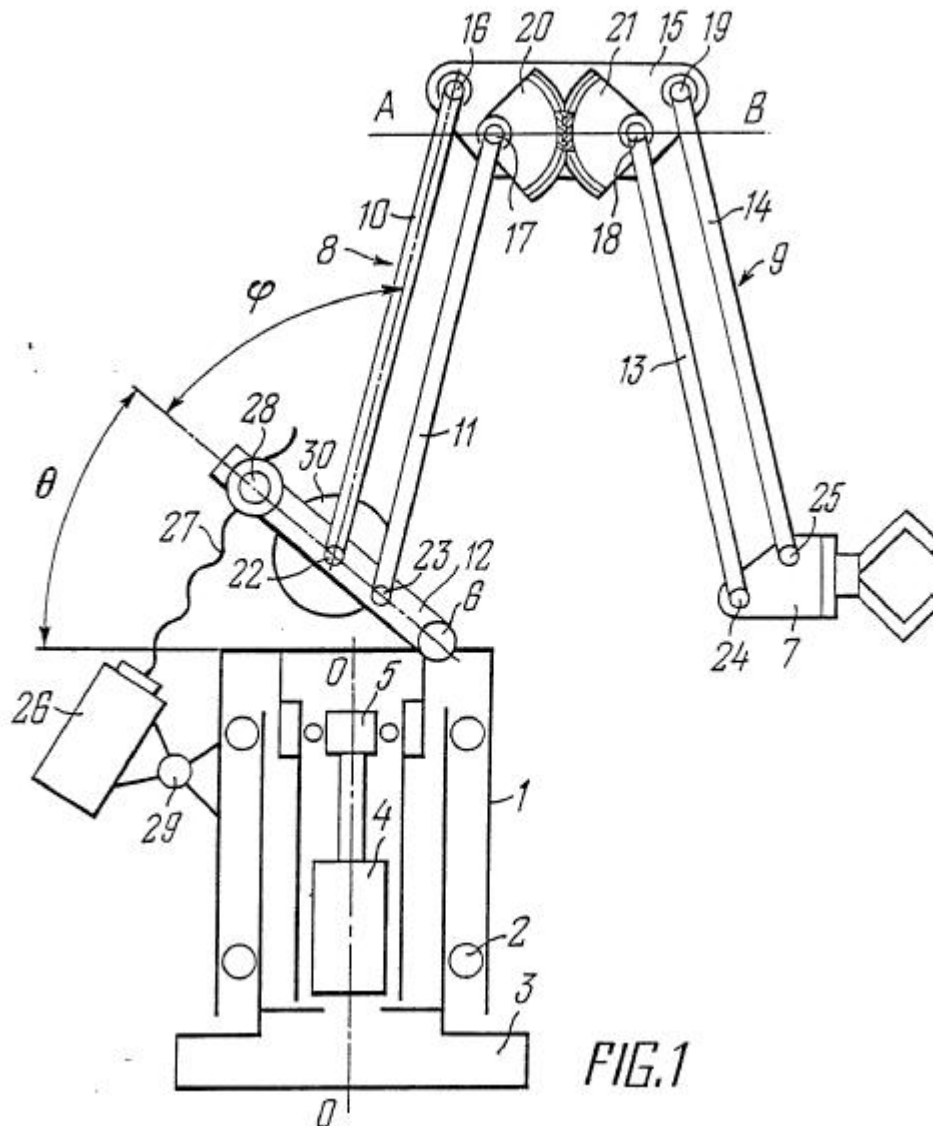
US 2008028880



This subclass/group covers:

Illustrative example of subject matter classified in [B25J 9/1065](#)

EP 0396752



### Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Parallel link type	3C007/BS22
--------------------	------------

**B25J 9/107**

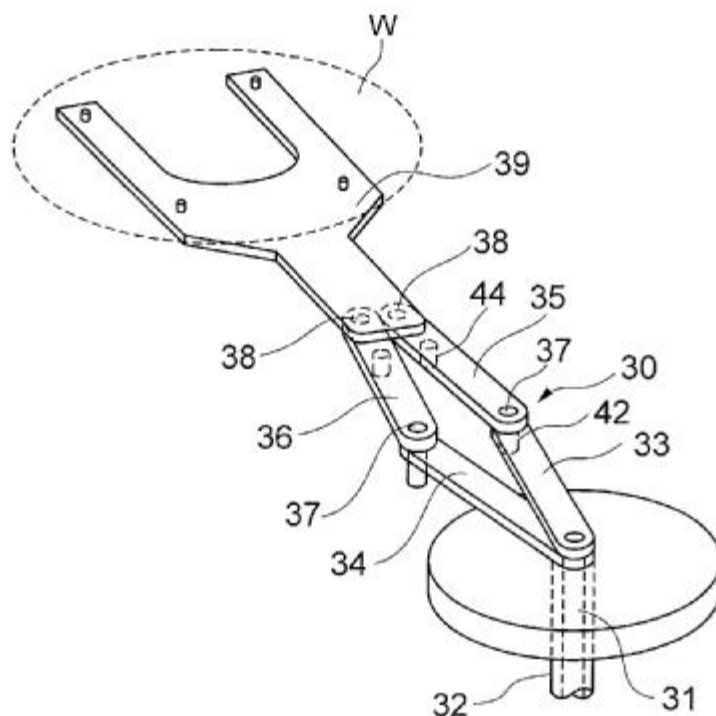
## [N: of the froglegs type]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/107](#)

WO 2010143505



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Apparatus for conveying wafers into and out of processing chamber via a lock	<a href="#">H01L 21/67739</a>
Apparatus specially adapted for handling semiconductor, the wafers being placed on a robot blade, or gripped by a gripper for conveyance	<a href="#">H01L 21/68707</a>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Frog-leg type	3C007/BS23
Pantograph mechanisms	5F031/GA44

## B25J 9/1075

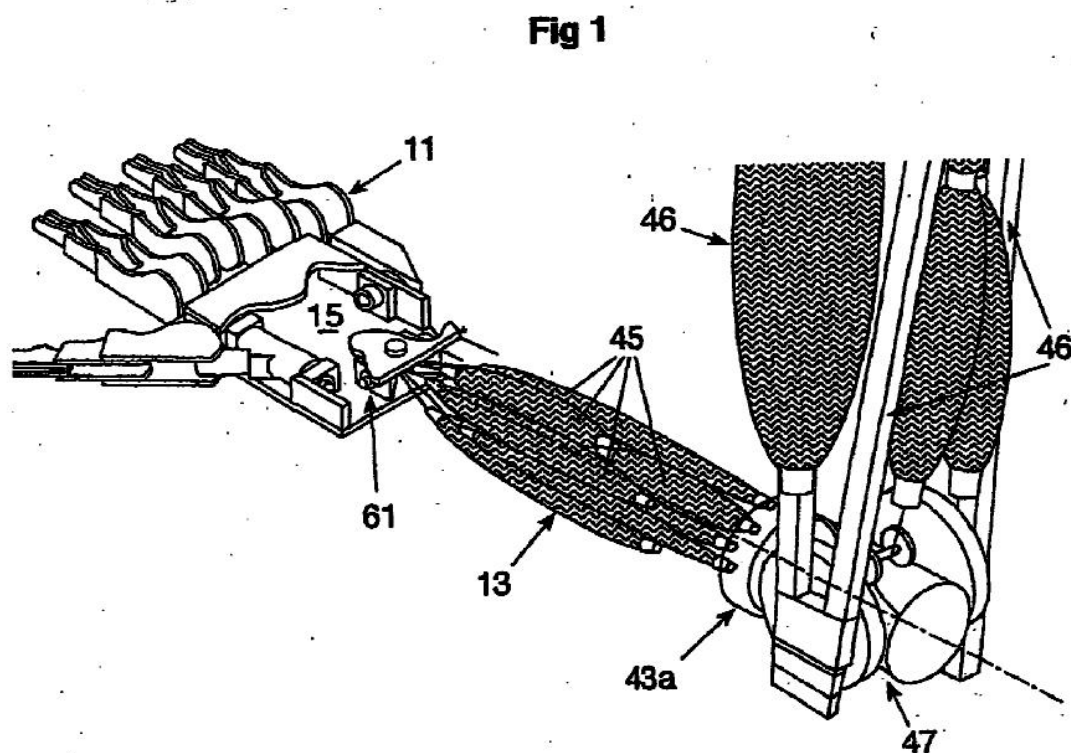
[N: with muscles or tendons]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1075](#)

US 2005121929



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Fluid-actuated devices for displacing a member, the motor being of the muscle type	<a href="#">F15B 15/103</a>
--	-----------------------------

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Artificial muscles	3C007/HS21
Types of actuators; Elastic shrink-tubes or rubber bags	3H081/AA18

### Special rules of classification within this group

Fluid activated muscles should additionally be classified in [B25J 9/142](#).

### B25J 9/108

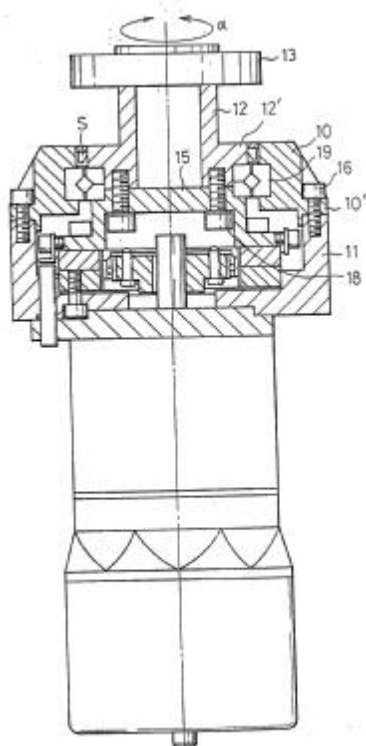
[N: Bearings specially adapted therefor (bearings in general F16C)]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/108](#)

EP 0300050



**B25J 9/1085**

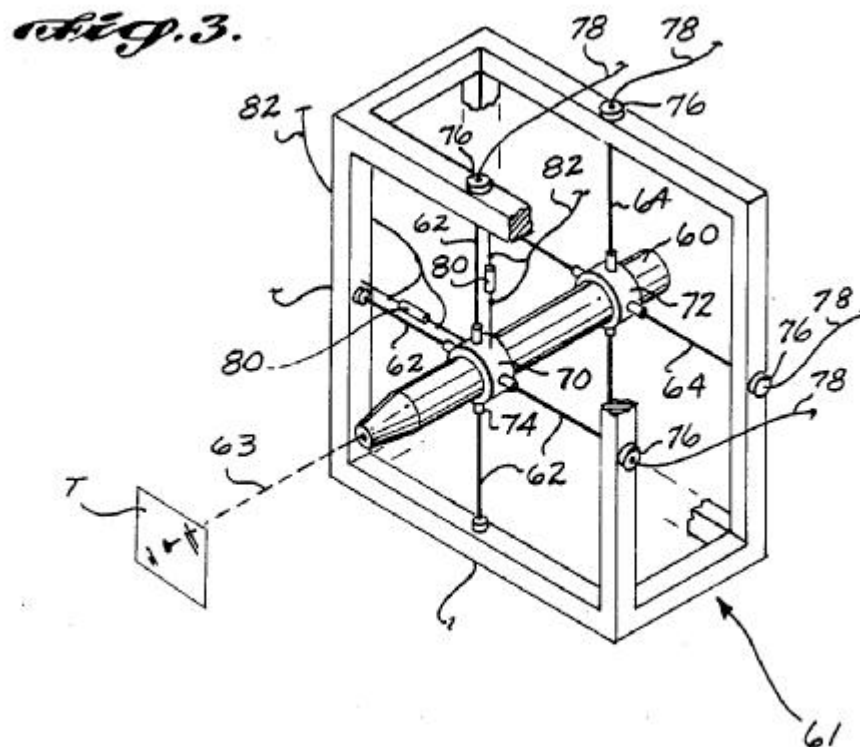
**[N: positioning by means of shape-memory materials (shape memory actuators F03G7/06)]**

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1085](#)

US 4932210



## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Mechano-thermal actuator	3C007/HS06
--------------------------	------------

**B25J 9/109**

**[N: comprising mechanical programming means, e.g. cams]**

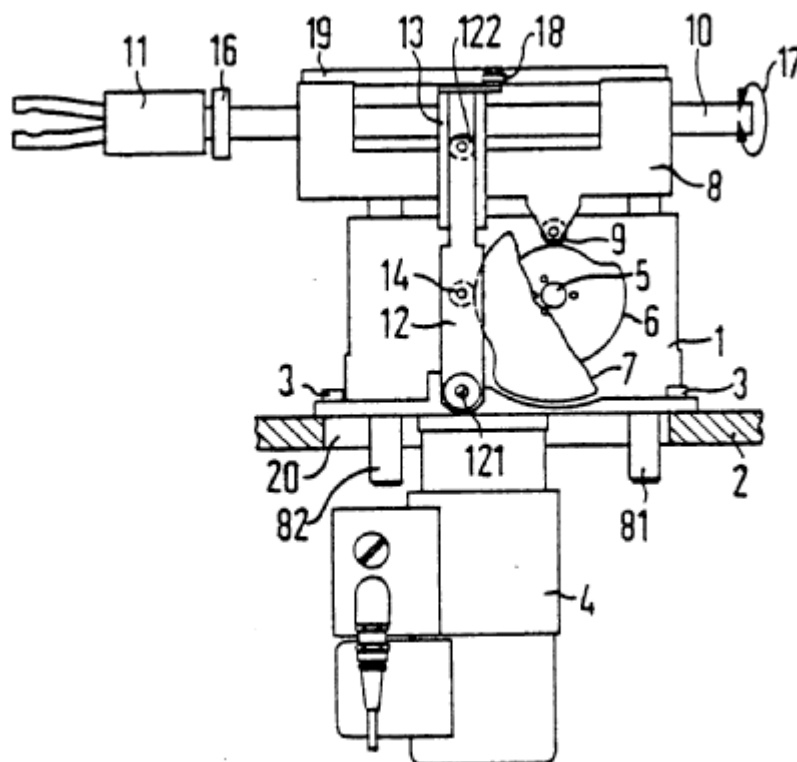


## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/109](#)

DE 2742103



## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Cam mechanism	3C007/HT33
---------------	------------

## B25J 9/1095

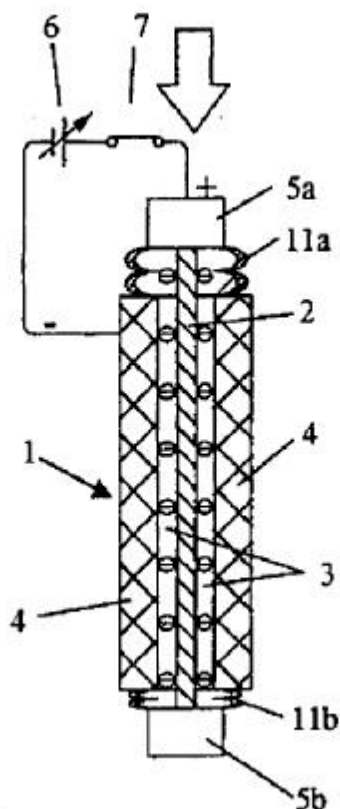
[N: chemically actuated]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1095](#)

US 2008169729



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Electro-chemical actuators	<a href="#">F03G 7/005</a>
----------------------------	----------------------------

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Mechano-chemical actuator	3C007/HS07
---------------------------	------------

## Synonyms and Keywords

In patent documents the following expression/word "polymer actuator" is often used.

## B25J 9/12

electric

## Definition statement

*This subclass/group covers:*  
Electric actuators specially adapted for manipulators.

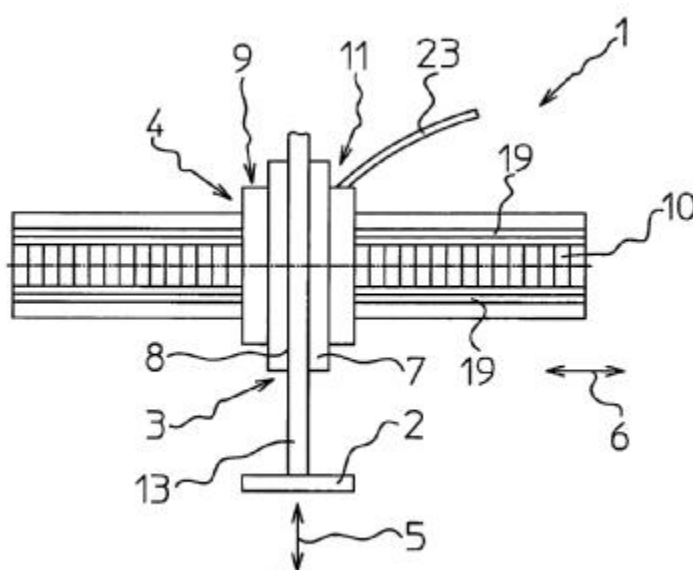
## B25J 9/123

### [N: Linear actuators]

#### Definition statement

*This subclass/group covers:*  
Illustrative example of subject matter classified in [B25J 9/123](#)

DE 102006016195



#### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Linear motors	<a href="#">H02K 41/02</a>
---------------	----------------------------

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Linear motors	3C007/HS26
---------------	------------

## B25J 9/126

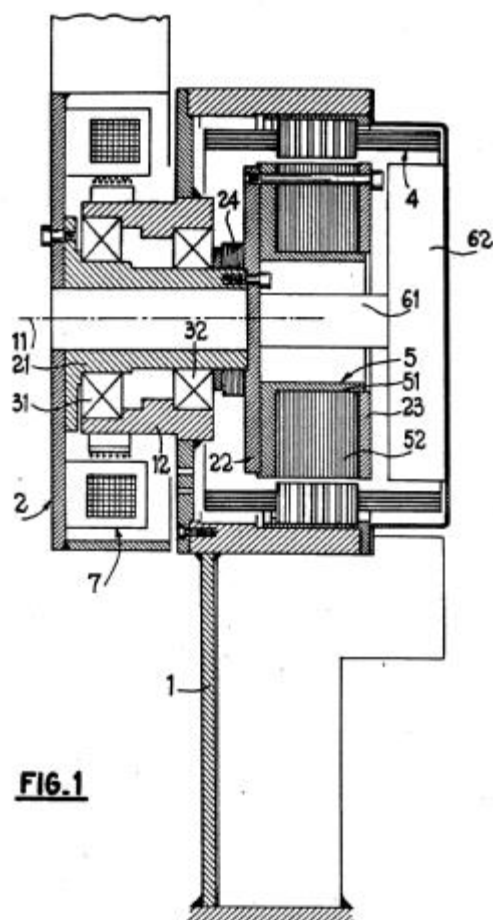
### [N: Rotary actuators]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/126](#)

FR 2617751



## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Terms (Japanese classification scheme), which may be of interest for search:

Rotary solenoid	3C007/HS25
-----------------	------------

**B25J 9/14**

**fluid**

## Definition statement

*This subclass/group covers:*

Pneumatic or hydraulic actuators specially adapted for manipulators.

## B25J 9/142

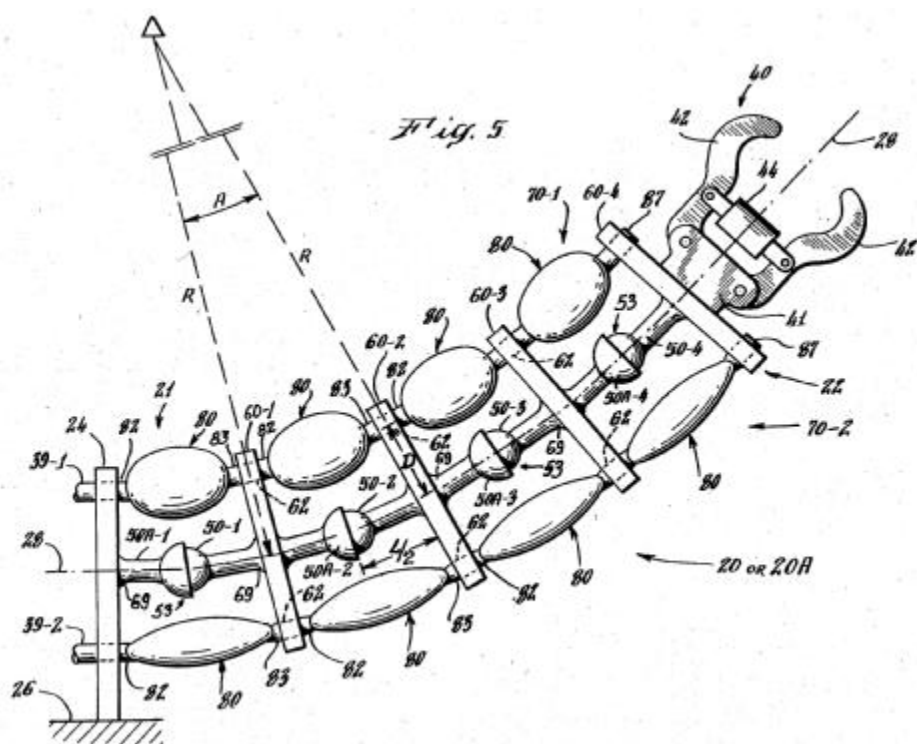
[N: comprising inflatable bodies]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/142](#)

US 4784042



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Fluid-actuated motor of the muscle type	<a href="#">F15B 15/103</a>
---	-----------------------------

## Special rules of classification within this group

McKibben actuators should additionally be classified in [B25J 9/1075](#).

## Synonyms and Keywords

In patent documents the following expressions/words "fluidic muscle", "rubbertuator" and "McKibben actuator" are often used as synonyms.

## B25J 9/144

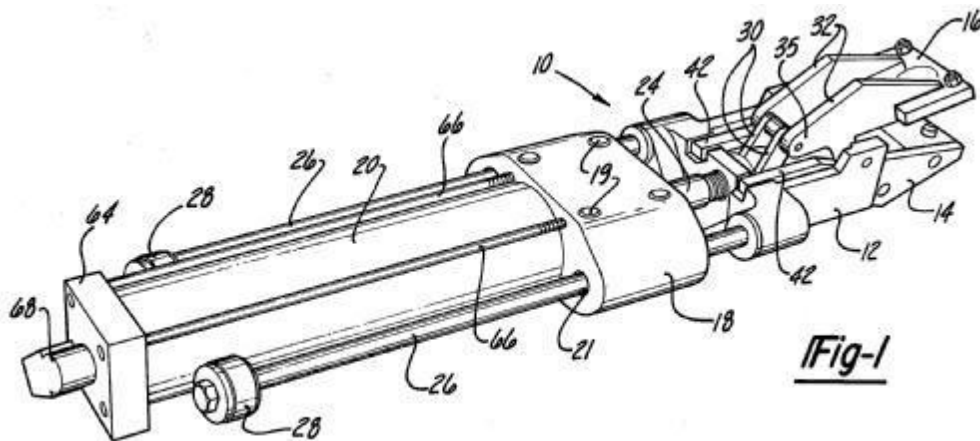
### [N: Linear actuators]

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/144](#)

US 4473249



## B25J 9/146

### [N: Rotary actuators]

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/146](#)

US 2011094325



**G05B19/00, e.g. numerical programme controls G05B19/18; [N: recording or playback systems G05B19/42])**

### **Definition statement**

*This subclass/group covers:*

All the topics linked to the control of manipulators.

## **B25J 9/1602**

**[N: characterised by the control system, structure, architecture]**

### **Definition statement**

*This subclass/group covers:*

Specific types of control systems.

## **B25J 9/1605**

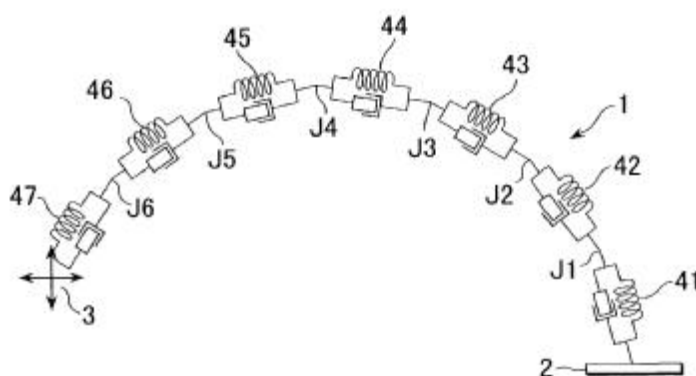
**[N: Simulation of manipulator lay-out, design, modelling of manipulator]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1605](#)

US 2003018412



## **B25J 9/1607**

**[N: Calculation of inertia, jacobian matrixes and inverses]**

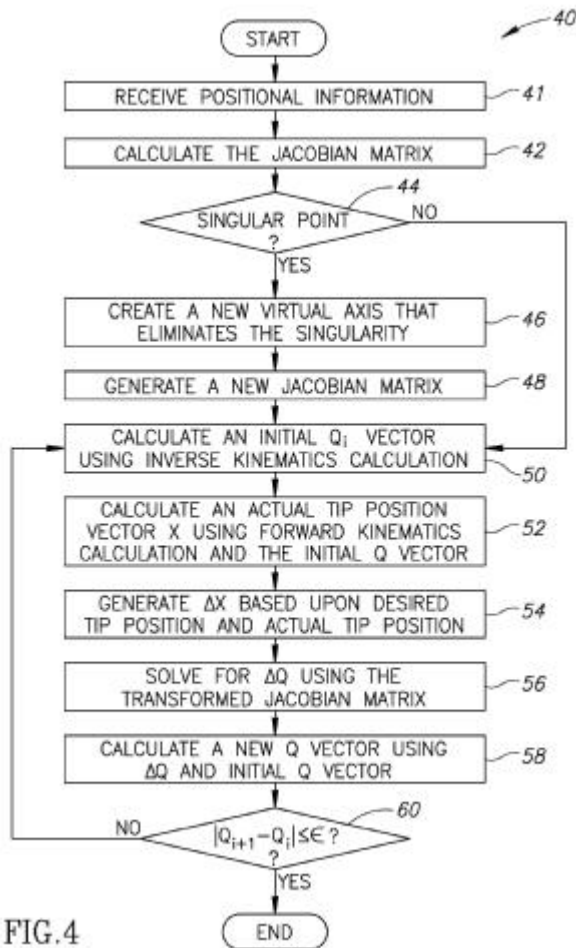
### **Definition statement**



*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1607](#)

US 2006271241



## B25J 9/161

[N: Hardware, e.g. neural networks, fuzzy logic, interfaces, processor]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/161](#)

US 5566275

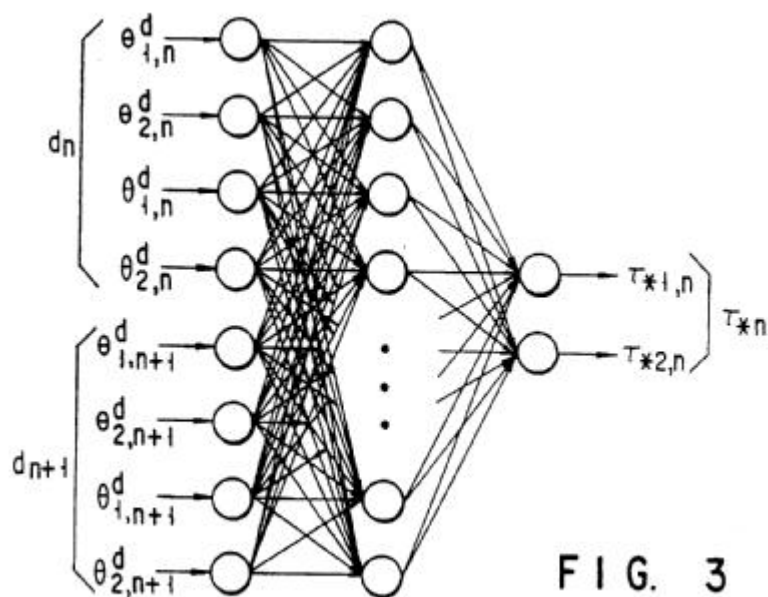


FIG. 3

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Computer systems based on biological models	<a href="#">G06N 3/00</a>
Artificial life based on physical entities controlled by simulated intelligence so as to replicate life forms, e.g. robots replicating pets of humans in their appearance or behaviour	<a href="#">G06N 3/008</a>
Using neural network models	<a href="#">G06N 3/02</a>

## B25J 9/1612

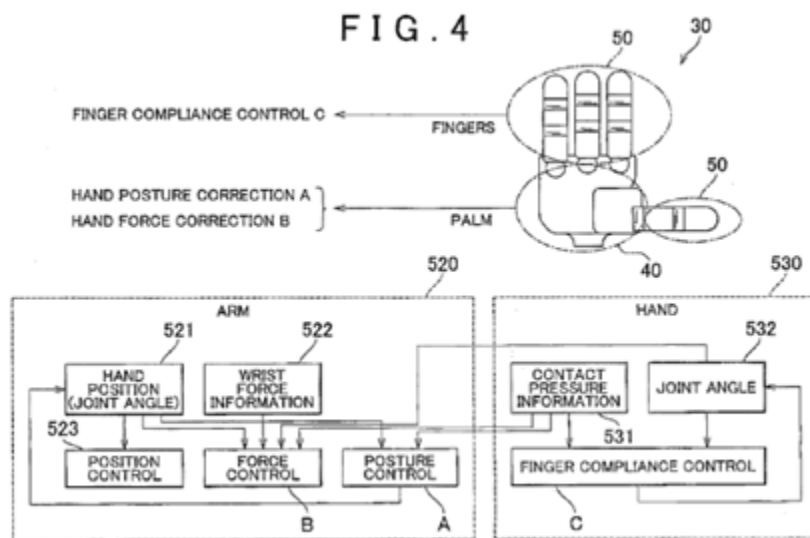
[N: characterised by the hand, wrist, grip control]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1612](#)

US 2010139437



## B25J 9/1615

[N: characterised by special kind of manipulator, e.g. planar, scara, gantry, cantilever, space, closed chain, passive/active joints and tendon driven manipulators]

### Definition statement

*This subclass/group covers:*

Control systems dedicated to specific types of manipulators.

## B25J 9/1617

[N: Cellular, reconfigurable manipulator, e.g. cebot]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1617](#)

AT 507947

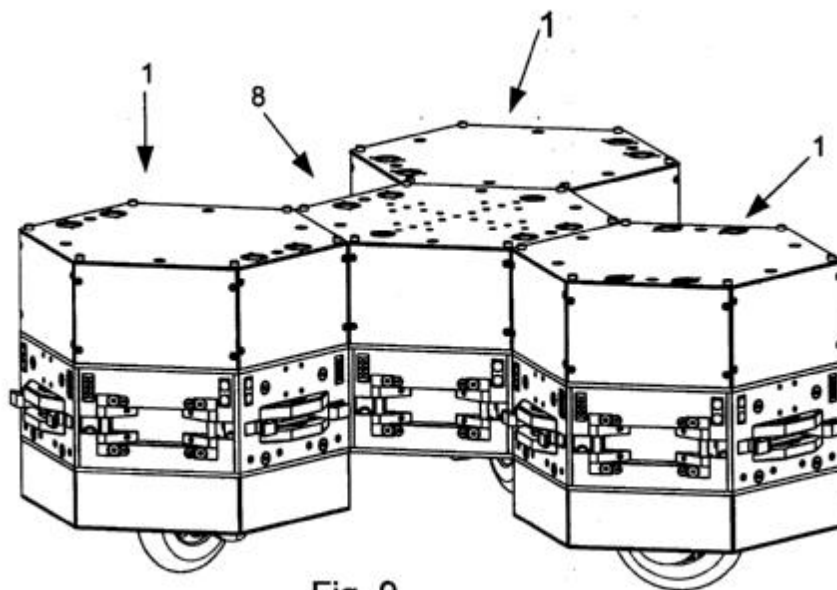


Fig. 9

## B25J 9/162

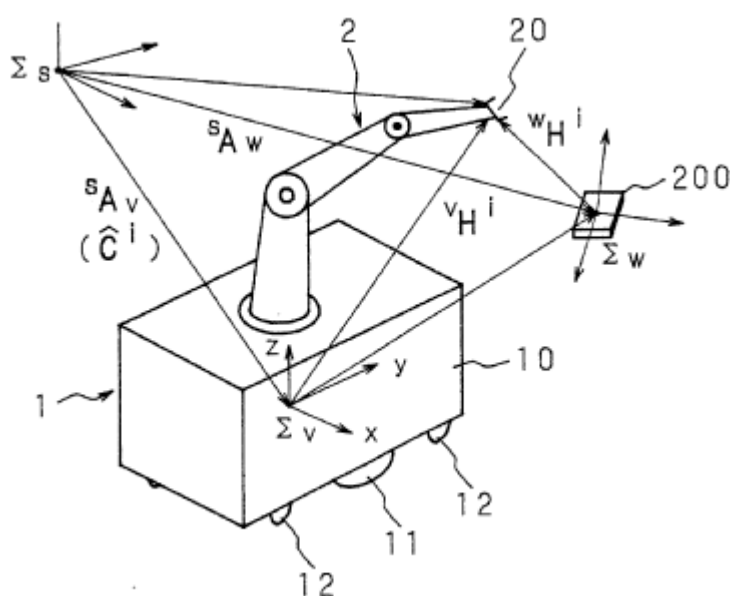
[N: Mobile manipulator, movable base with manipulator arm mounted on it]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/162](#)

US 5542028



## B25J 9/1623

[N: Parallel manipulator, Stewart platform, links are attached to a common base and to a common platform, plate which is moved parallel to the base]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1623](#)

EP 0109201

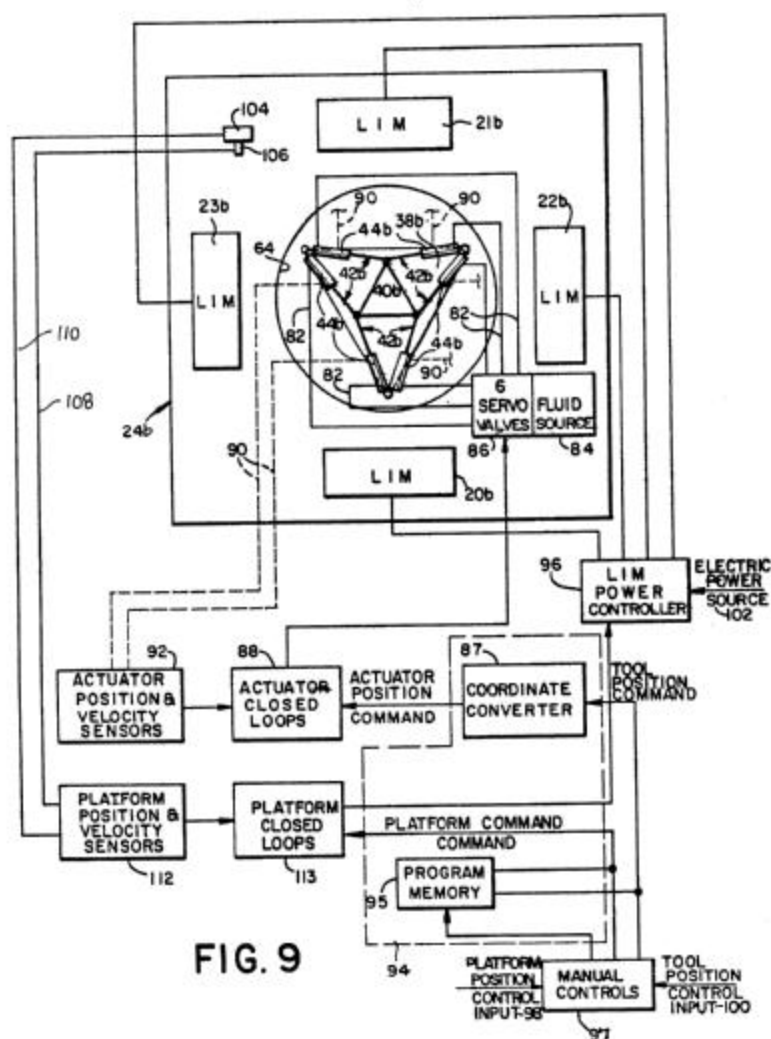


FIG. 9

### Special rules of classification within this group

Parallel manipulators as such should additionally be classified in [B25J 9/106](#), [B25J 17/0216](#) or [B25J 17/0266](#).

## B25J 9/1625

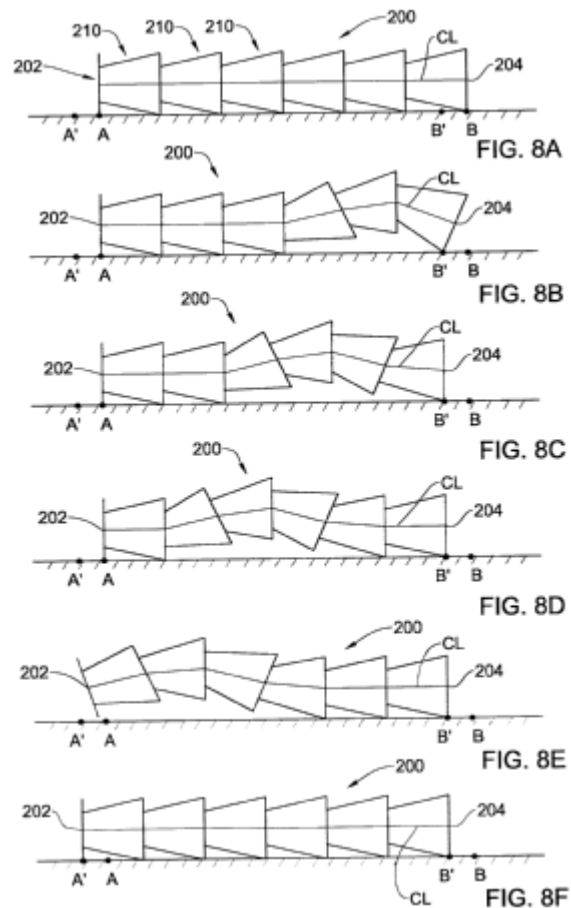
[N: Truss-manipulator for snake-like motion]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1625](#)

WO 2010143192



## B25J 9/1628

[N: characterised by the control loop]

### Definition statement

*This subclass/group covers:*

Specific types of control loops.

## B25J 9/163

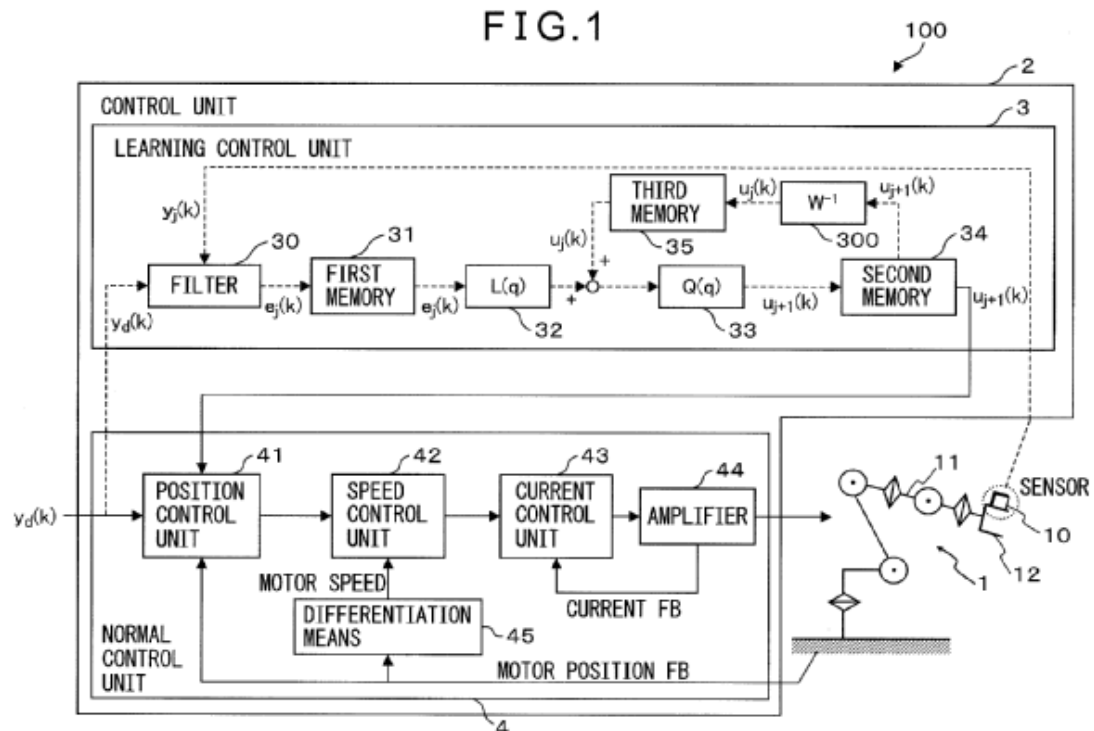
[N: learning, adaptive, model based, rule based expert control]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/163](#)

US 2011208356



## B25J 9/1633

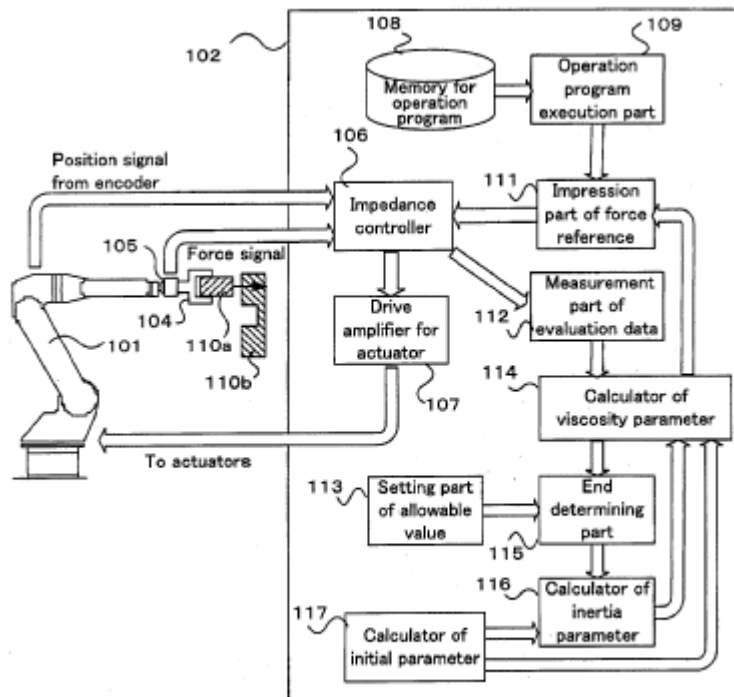
[N: compliant, force, torque control, e.g. combined with position control]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1633](#)

EP 2314426



**B25J 9/1635**

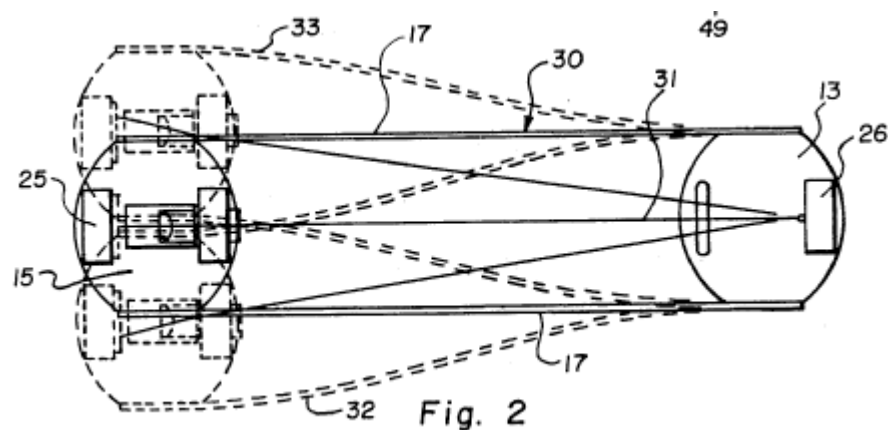
[N: flexible-arm control]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1635](#)

US 5049797



**B25J 9/1638**

[N: compensation for arm bending/inertia, pay load]



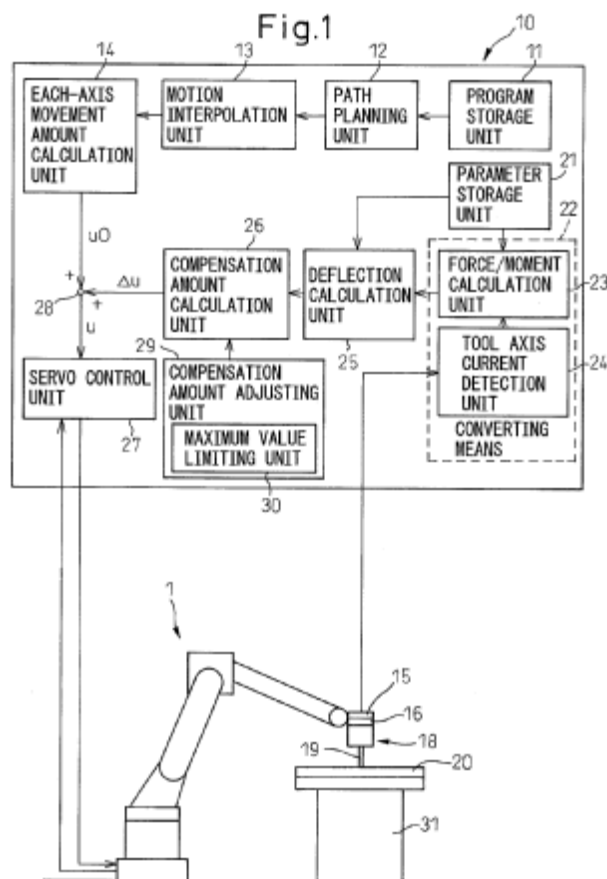
weight/inertia]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1638](#)

US 2008297092



**B25J 9/1641**

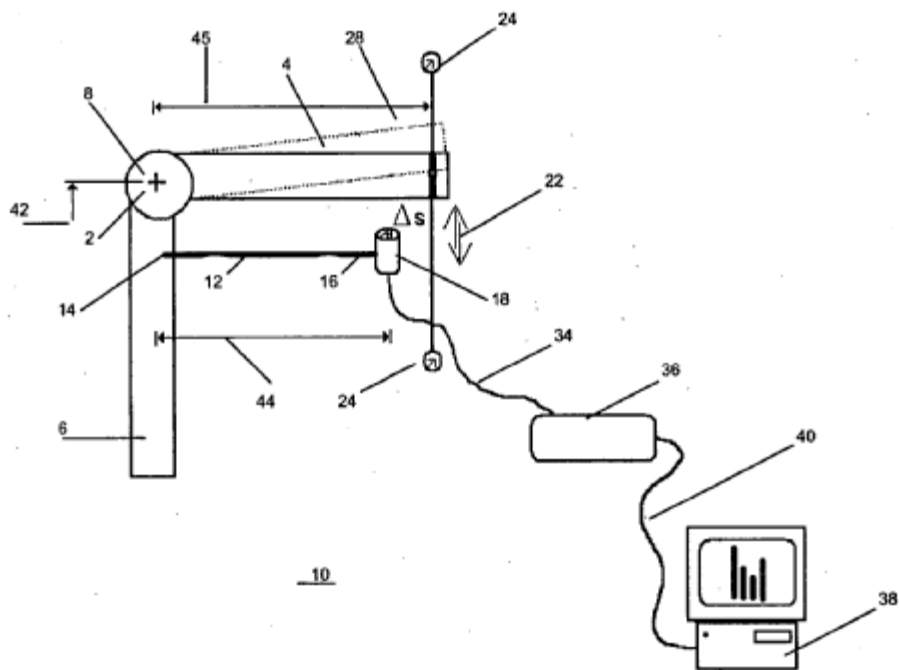
[N: compensation for backlash, friction, compliance, elasticity in the joints]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1641](#)

EP 1607193



## B25J 9/1643

[N: redundant control]

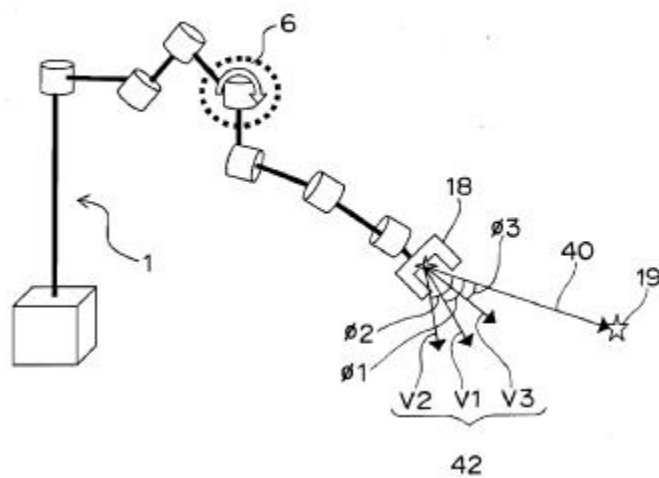
### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1643](#)

US 2010168919

Fig. 5B



### Glossary of terms

In this subclass/group, the following terms (or expressions) are used with the meaning indicated:

Redundant control	designates the control of a redundant manipulators, i.e. which have redundant joints (It does not mean that several control systems are used in parallel).
-------------------	--

## Synonyms and Keywords

In patent documents the following expression/word "avoiding singularities" is often used.

## B25J 9/1646

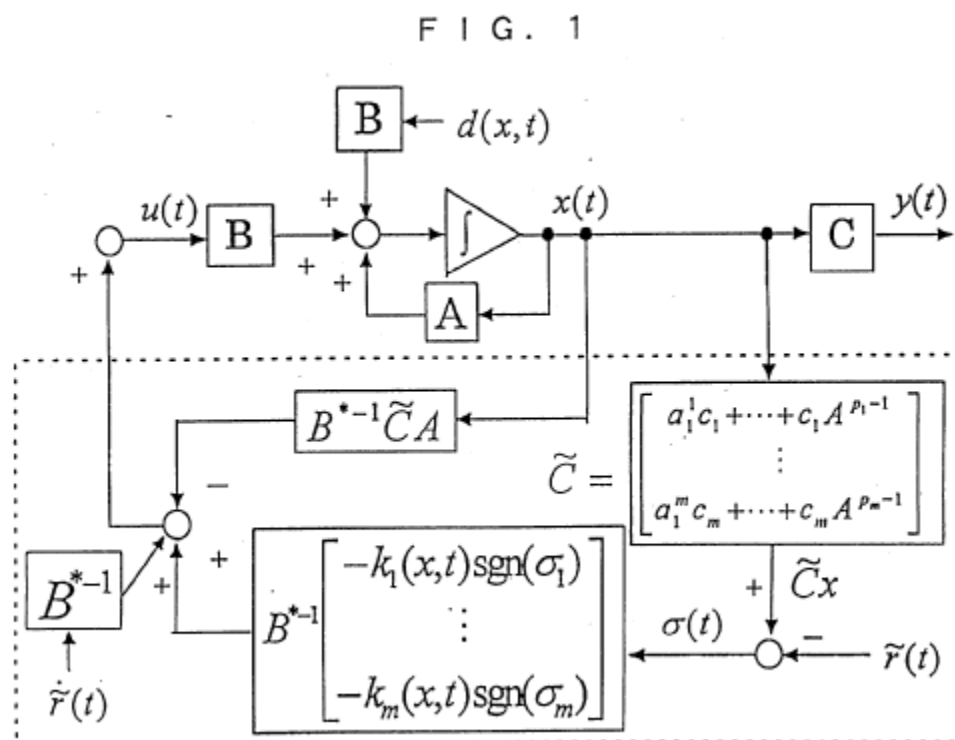
[N: variable structure system, sliding mode control]

### Definition statement

This subclass/group covers:

Illustrative example of subject matter classified in [B25J 9/1646](#)

EP 0875341



## B25J 9/1648

[N: non-linear control combined or not with linear control]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1648](#)

EP 0128355

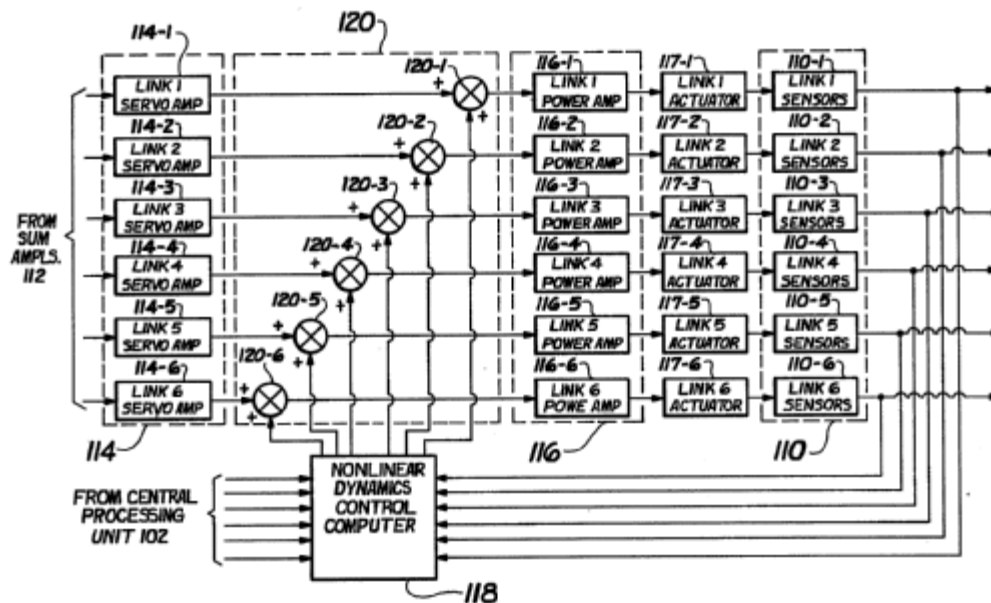


Fig-5

3/6

## B25J 9/1651

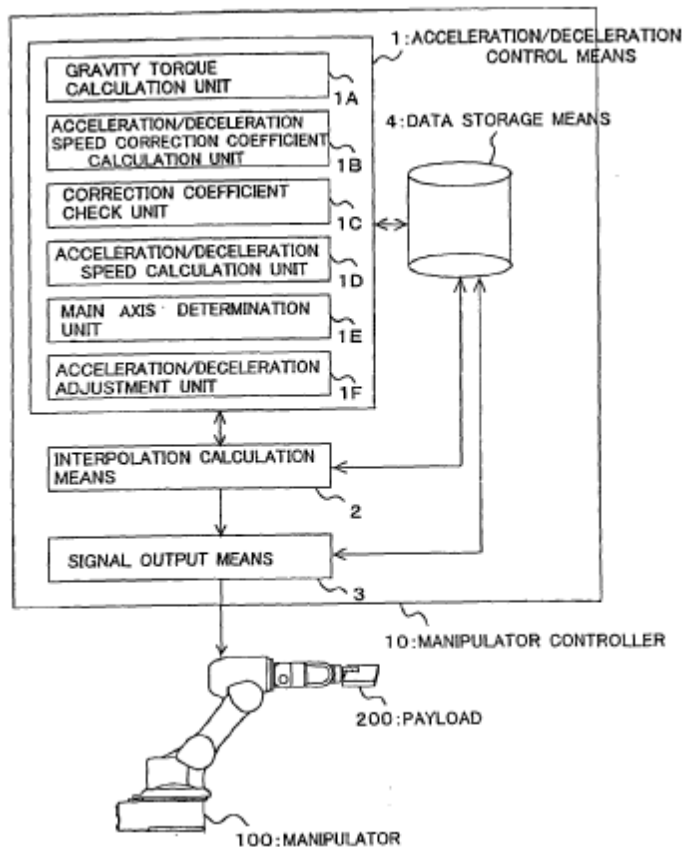
[N: acceleration, rate control]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1651](#)

EP 1702726



## B25J 9/1653

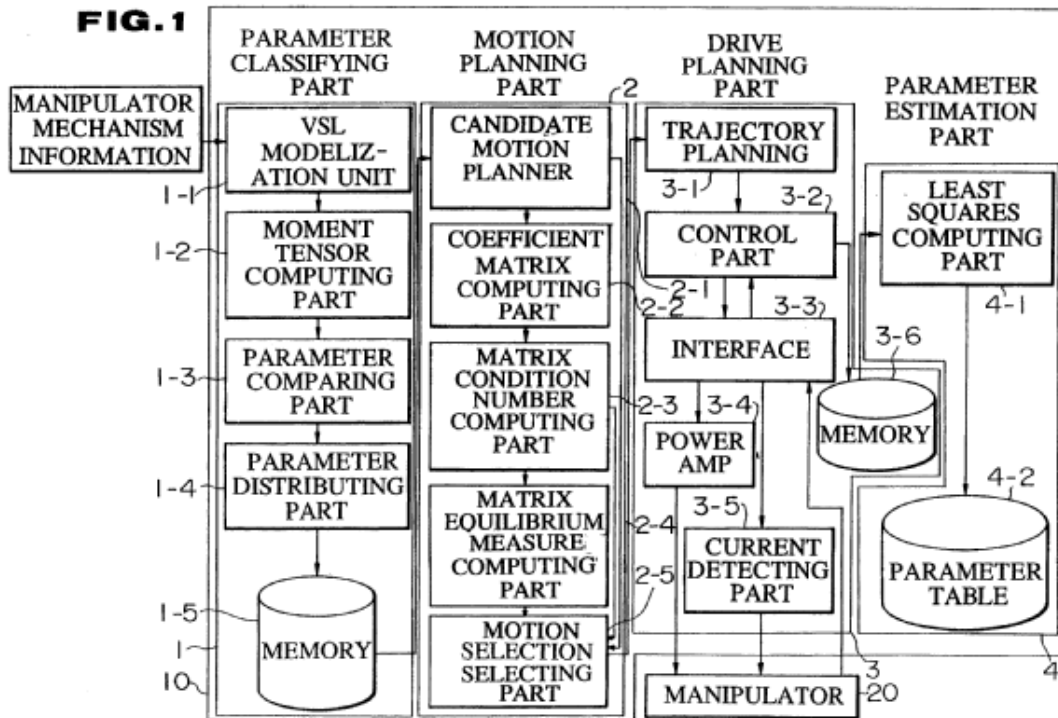
[N: parameters identification, estimation, stiffness, accuracy, error analysis]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1653](#)

US 5357424



## B25J 9/1656

[N: characterised by programming, planning systems for manipulators]

### Definition statement

*This subclass/group covers:*

Different types or robot programmes.

## B25J 9/1658

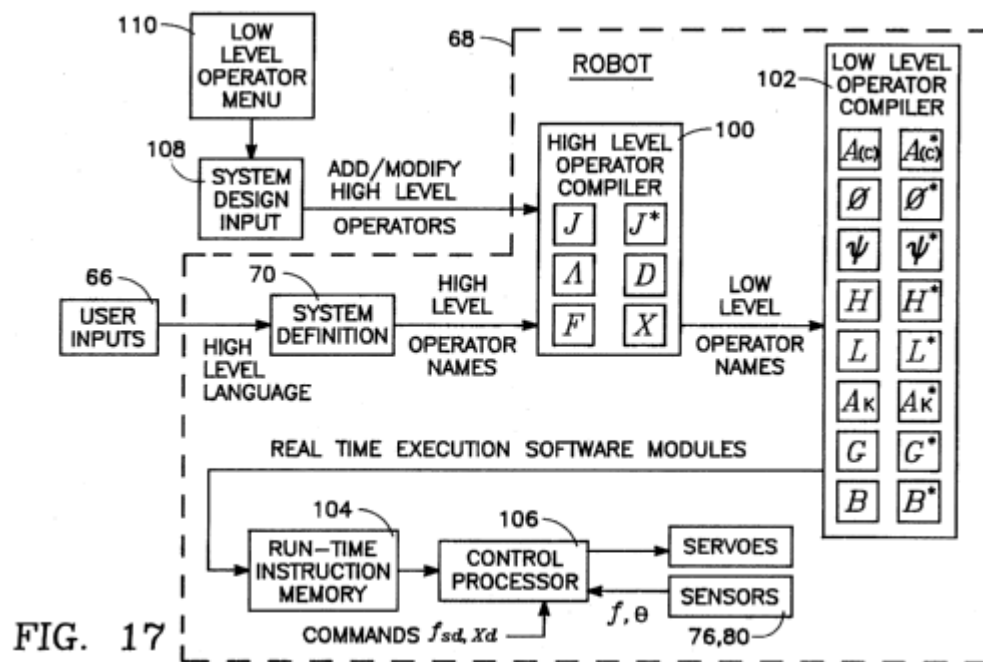
[N: characterised by programming language]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1658](#)

US 5519814



**B25J 9/1661**

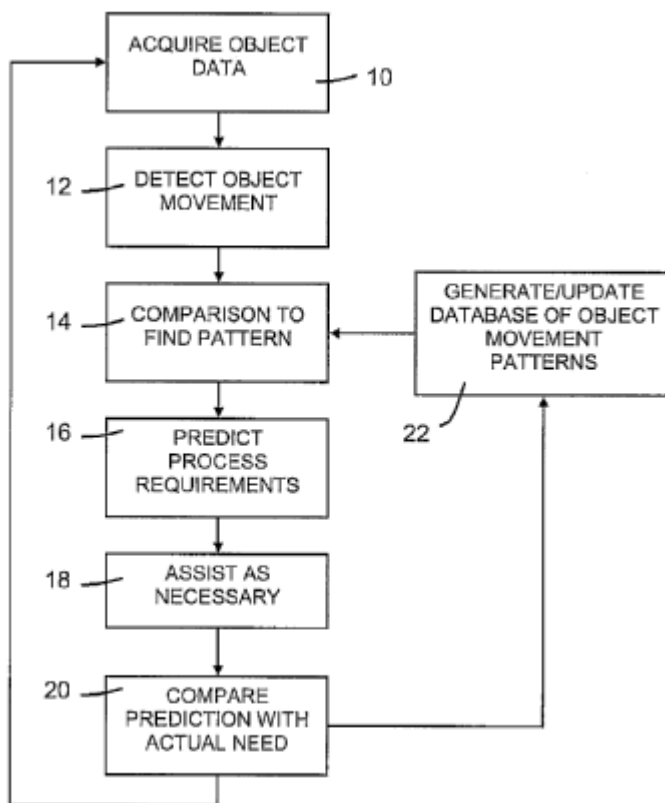
[N: characterised by task planning, object-oriented languages]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1661](#)

US 2009210090



## B25J 9/1664

[N: characterised by motion, path, trajectory planning]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1664](#)

FR 2682905



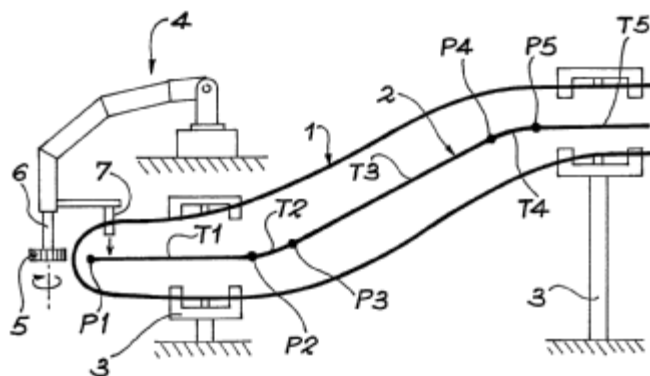


FIG. 2

## B25J 9/1666

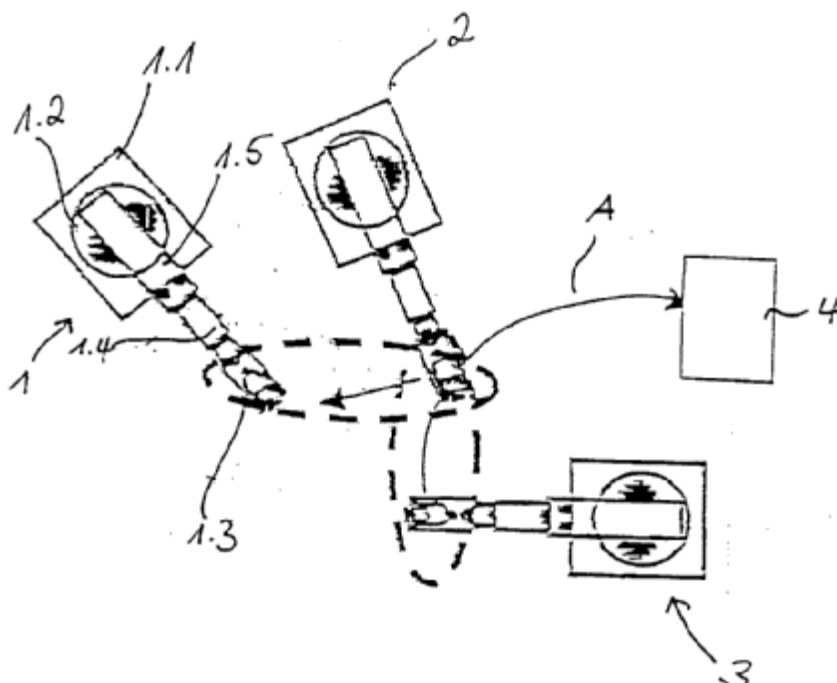
[N: Avoiding collision or forbidden zones]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1666](#)

EP 1604790



## B25J 9/1669

[N: characterised by special application, e.g. multi-arm]

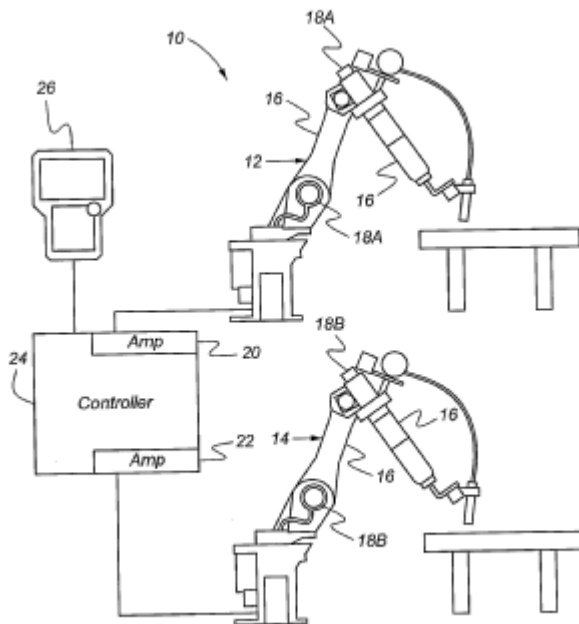
**co-operation, assembly, grasping]**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1669](#)

WO 2004114037



**B25J 9/1671**

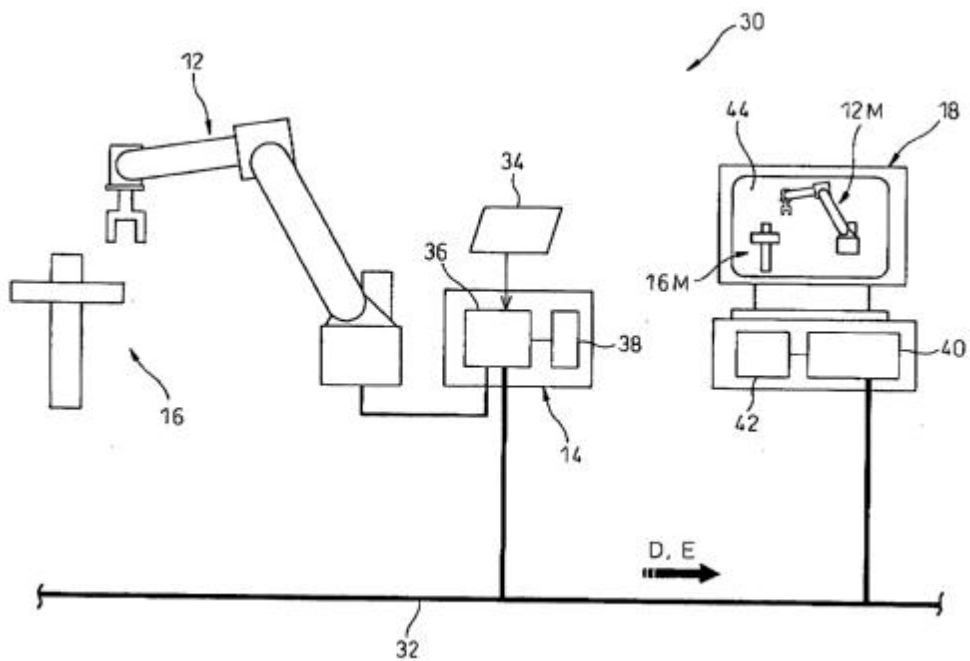
**[N: characterised by simulation, either to verify existing program or to create and verify new program, CAD/CAM oriented, graphic oriented programming systems]**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1671](#)

EP 1759817



## B25J 9/1674

[N: characterised by safety, monitoring, diagnostic]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1674](#)

EP 1731978



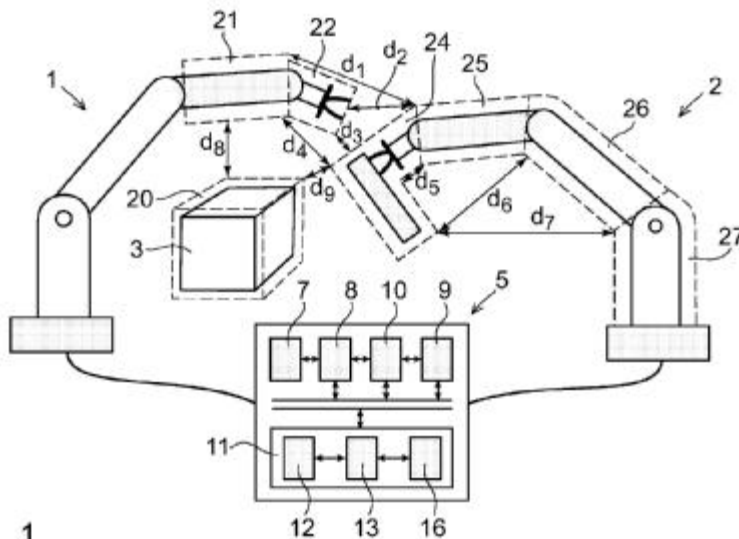


Fig. 1

## B25J 9/1679

[N: characterised by the tasks executed]

### Definition statement

*This subclass/group covers:*

Different control systems dedicated to a specific task of the manipulator.

## B25J 9/1682

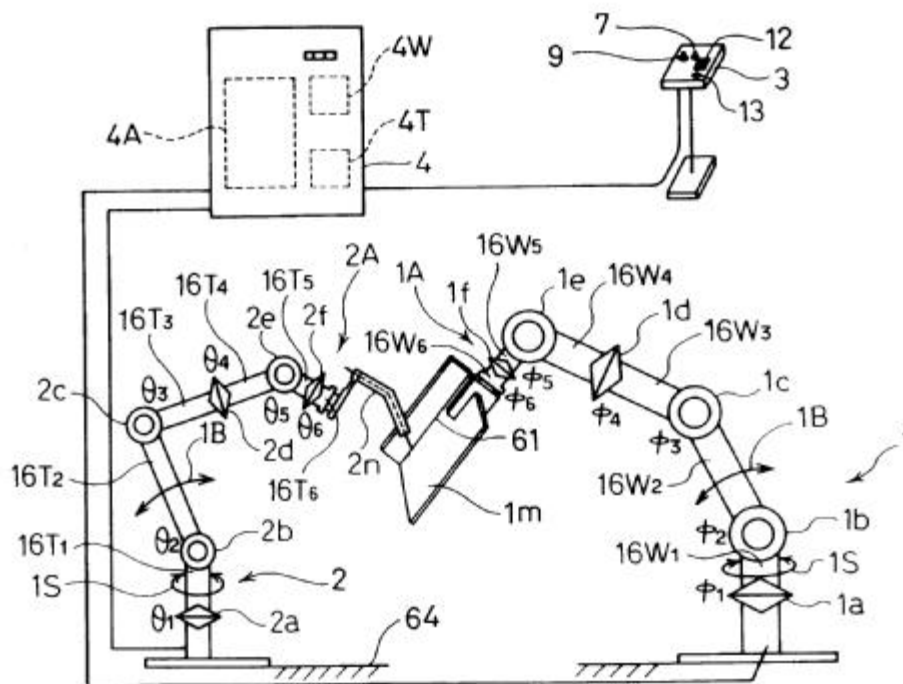
[N: Dual arm manipulator; Coordination of several manipulators]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1682](#)

EP 0607619



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Overall configuration relating to peripheral devices such as other robots	3C007/JS02
Cooperation of manipulators with each other	3C007/LV02

## B25J 9/1684

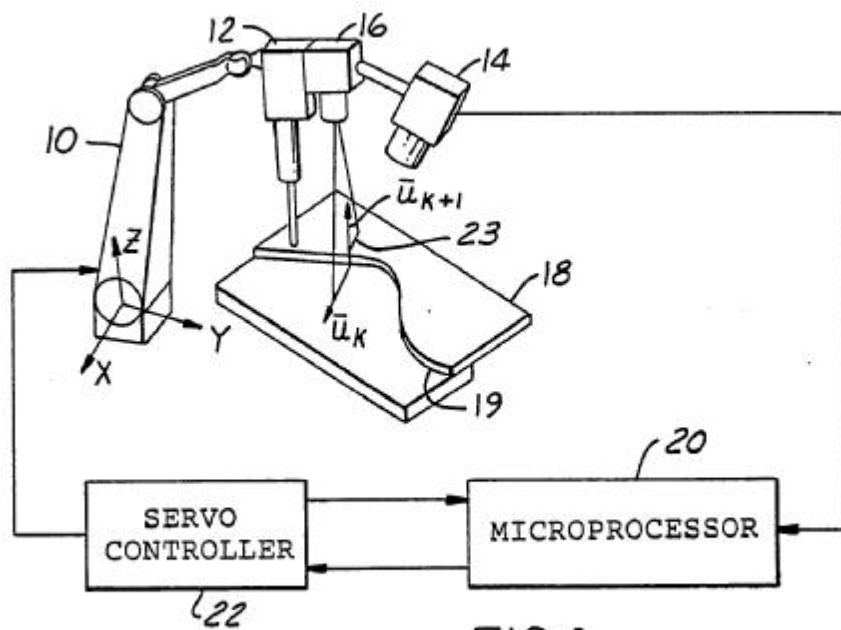
[N: Tracking a line or surface by means of sensors]

### Definition statement

This subclass/group covers:

Illustrative example of subject matter classified in [B25J 9/1684](#)

EP 0361663



## B25J 9/1687

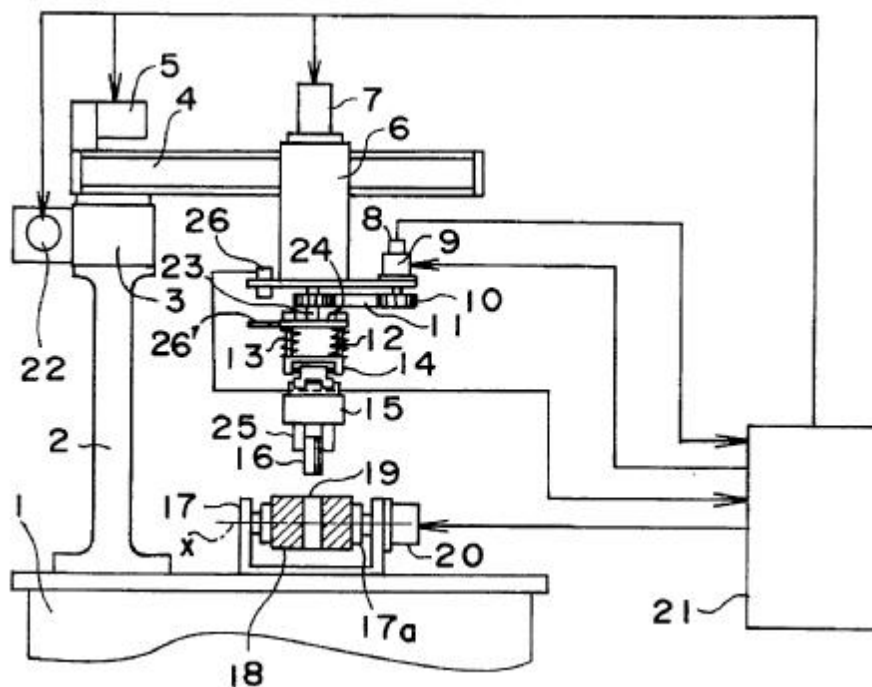
[N: Assembly, peg and hole, palletising, straight line, weaving pattern movement]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1687](#)

US 5619782



## Special rules of classification within this group

Compliant mechanisms per se should additionally be classified in [B25J 17/0208](#).

## B25J 9/1689

[N: Teleoperation]

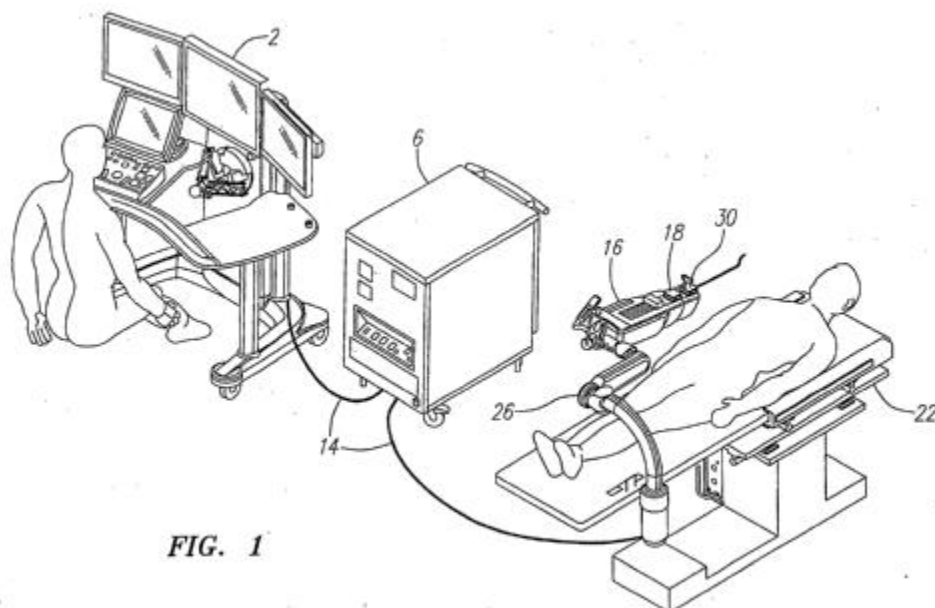
## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1689](#)

WO 2007136803





## Special rules of classification within this group

Master / slave systems as such should additionally be classified in [B25J 3/00](#).

Hand-grip control means as such should additionally be classified in [B25J 13/02](#).

## B25J 9/1692

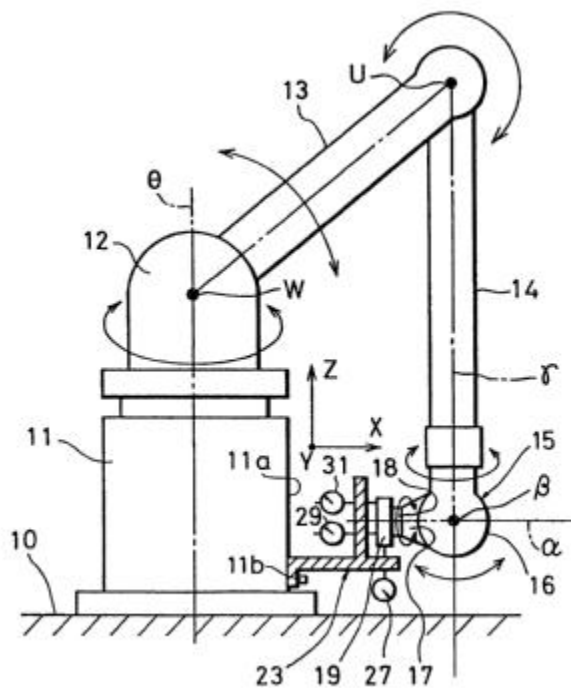
### [N: Calibration of manipulator]

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1692](#)

EP 0223862



## B25J 9/1694

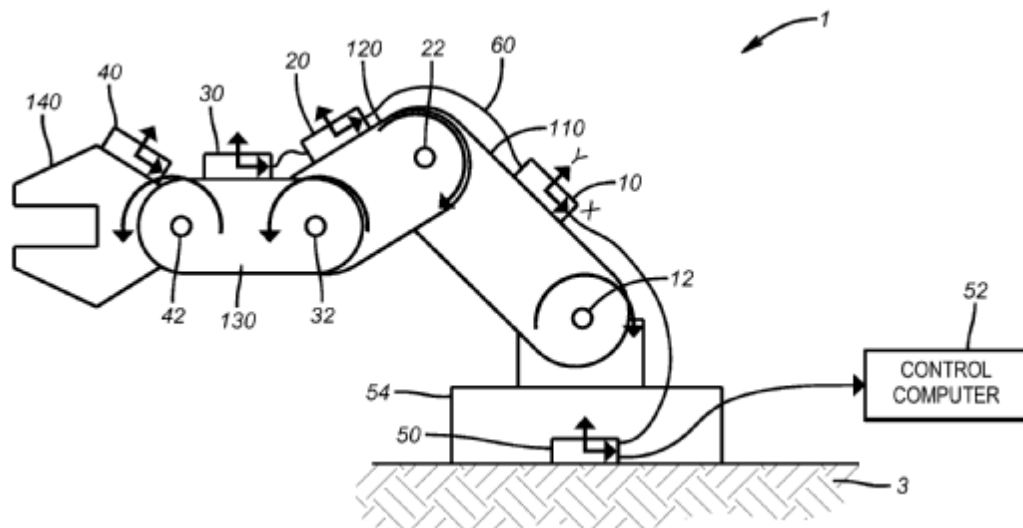
[N: characterised by use of sensors other than normal servo-feedback from position, speed or acceleration sensors, perception control, multi-sensor controlled systems, sensor fusion]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1694](#)

WO 2010019310



## B25J 9/1697

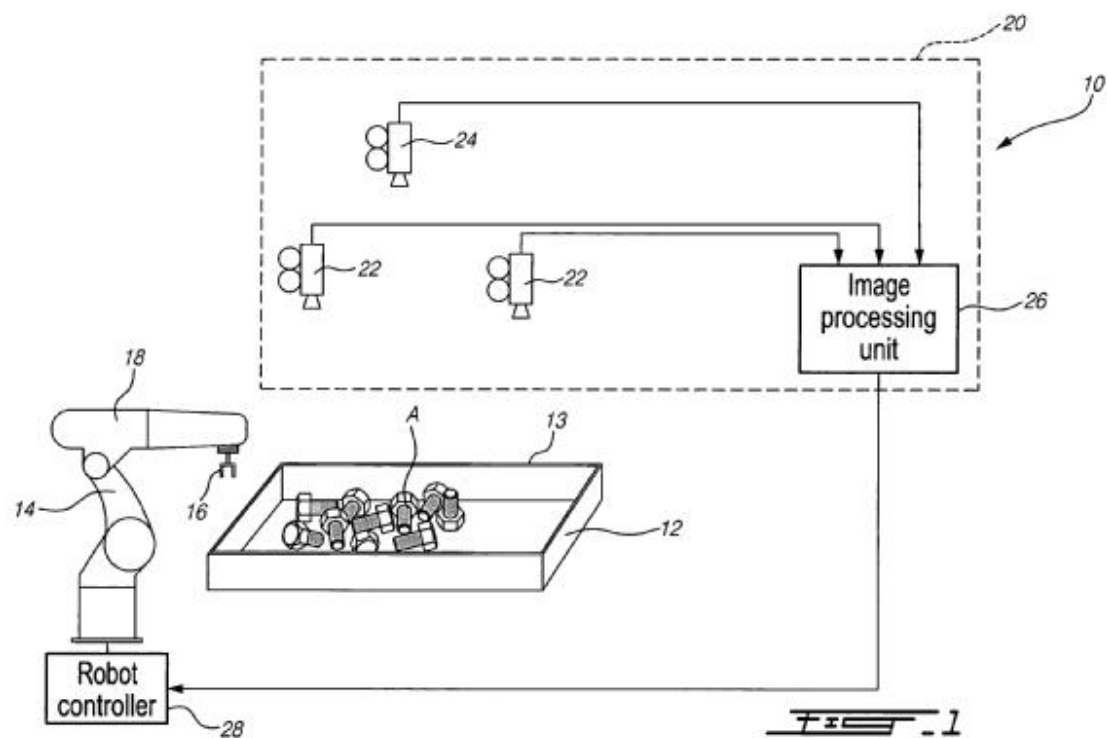
### [N: Vision controlled systems]

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/1697](#)

US 7313464



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Image feed-back for automatic industrial control, e.g. robot with camera	<a href="#">G06T 1/0014</a>
Image analysis	<a href="#">G06T 7/00</a>

## Special rules of classification within this group

Details concerning the mounting of the vision system on the manipulator should be classified in [B25J 19/021](#).

## B25J 9/20

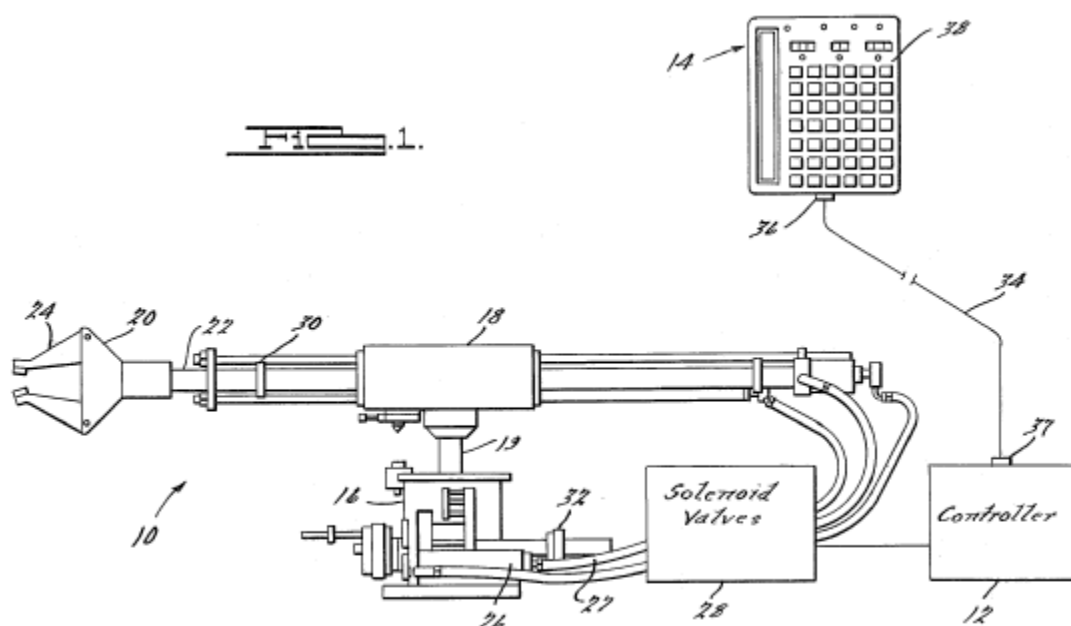
### fluidic

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 9/20](#)

US 4379335



## B25J 11/00

### Manipulators not otherwise provided for

#### Definition statement

*This subclass/group covers:*

Special types of manipulators not covered by the other groups of [B25J](#) or manipulators for performing a specific tasks not covered by other subclasses.

## B25J 13/00

### Controls for manipulators (programme controls B25J9/16; control in general G05)

#### Definition statement

*This subclass/group covers:*

Hardware components involved in the motion control procedure of a manipulator.

This includes input means which allow a user/operator to give instructions to the manipulator (i.e. to control its motions in real-time or to teach such motions).

This also includes all types of sensors which measure a physical quantity of the manipulator (e.g. force or speed) or its environment and convert it into a signal for a motion control system of the manipulator.

## B25J 13/003

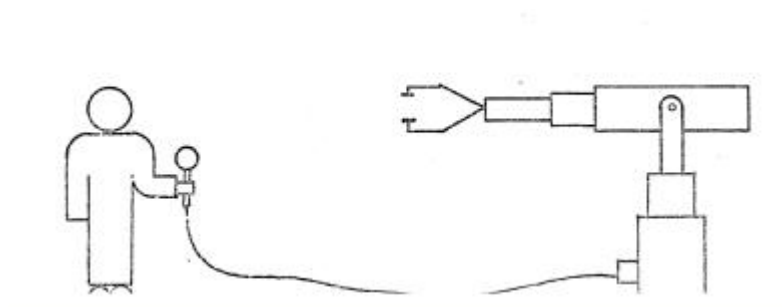
### [N: by means of an audio-responsive input (audible safety signals B25J19/061)]

#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/003](#)

DE 3327808



## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Speech recognition	<a href="#">G10L 15/00</a>
--------------------	----------------------------

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Control of robot by voice input	3C007/WB19
---------------------------------	------------

## Synonyms and Keywords

In patent documents the following expression/word "voice control" is often used.

## B25J 13/02

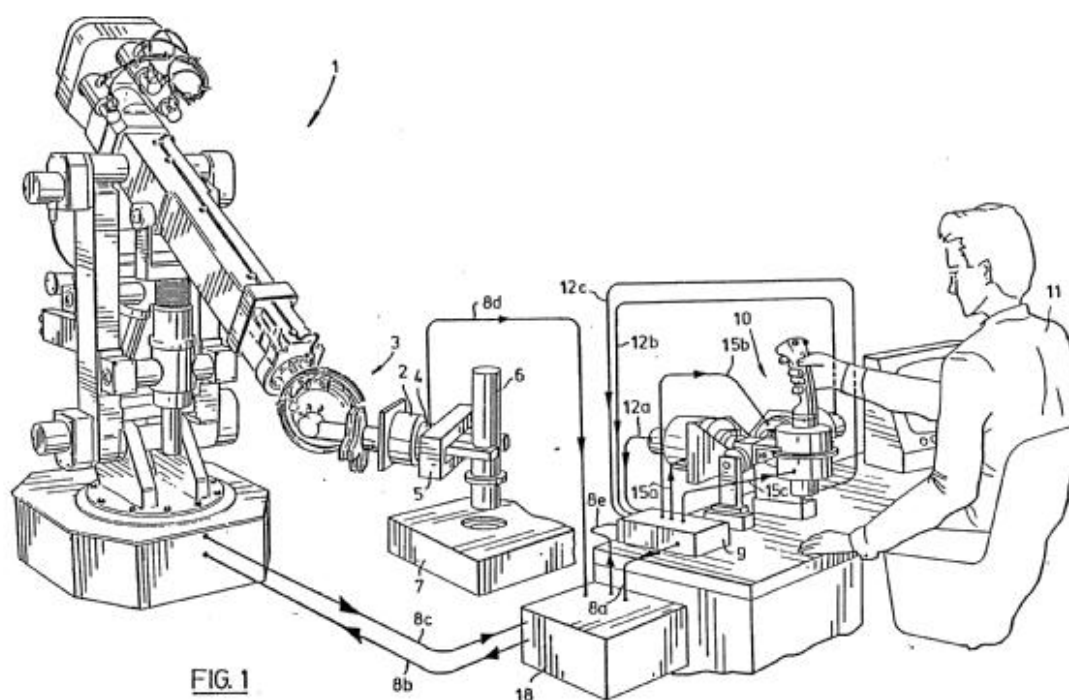
**Hand grip control means [N: (handles or pedals for crane control B66C13/56; for measuring the force applied to control members G01L5/22; hand-held casings for switching devices, e.g. joy-sticks H01H9/0214)]**

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/02](#)

EP 0353841



## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Manually-actuated control mechanisms movable by hand about orthogonal axes, e.g. joysticks	<a href="#">G05G 9/047</a>
--	----------------------------

**B25J 13/04**

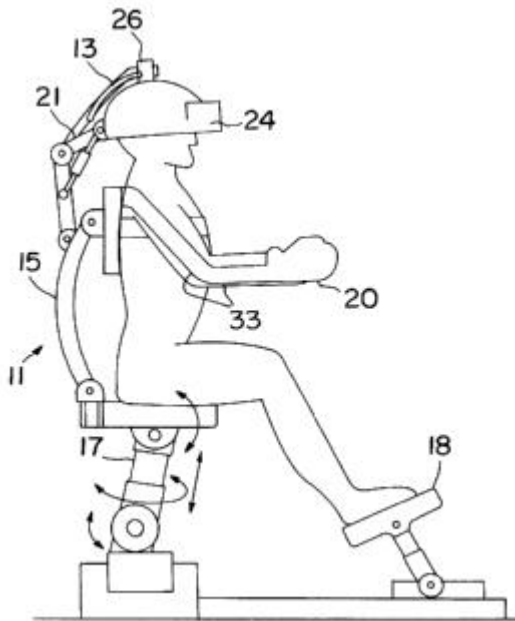
## Foot-operated control means

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/04](#)

US 6016385



## **B25J 13/06**

**Control stands, e.g. consoles, switch-boards**

### **Definition statement**

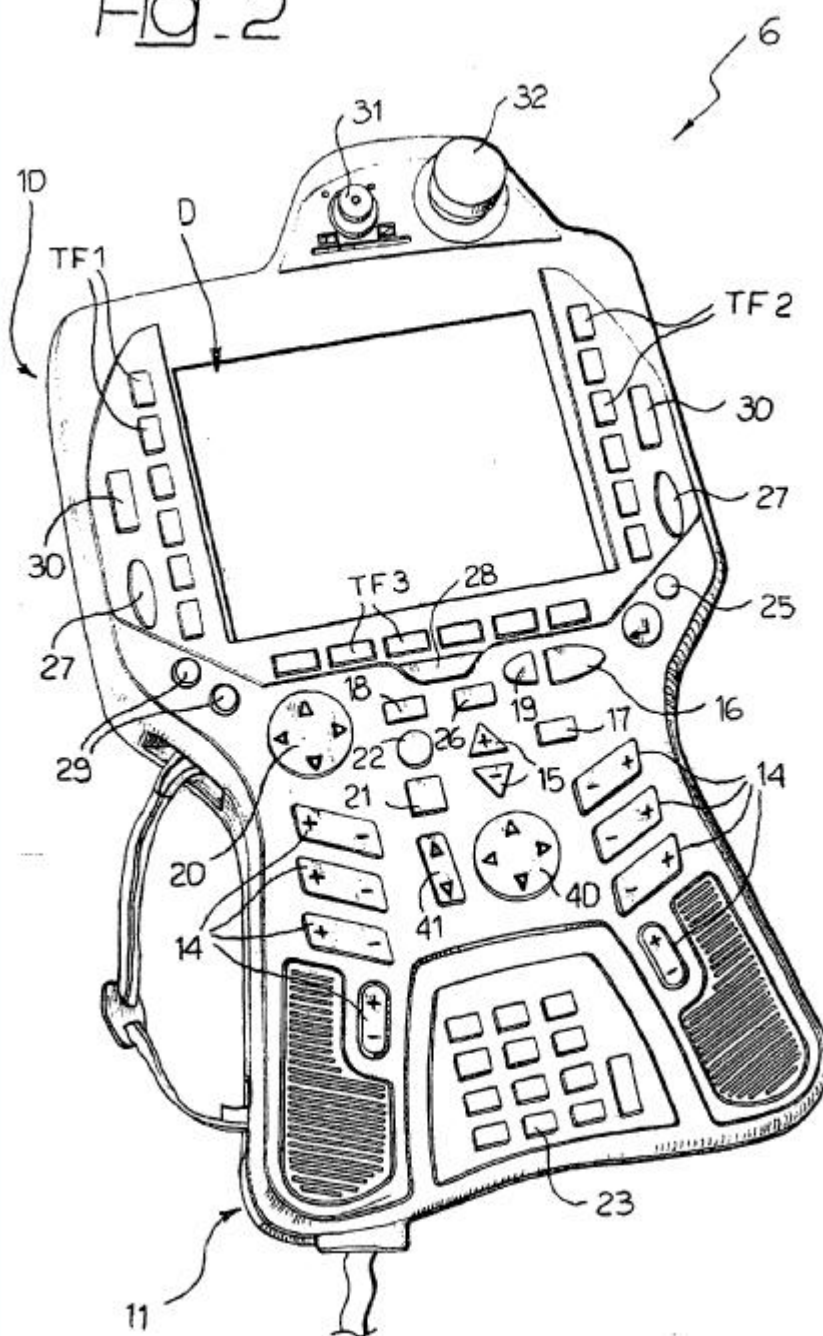
*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/06](#)

EP 1405700



Fig. 2



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Structure of operator panel	3C007/JU01
With human interface part	3C007/JU02

With display device	3C007/JU03
Operator panel type	3C007/JU11
Remote operation	3C007/JU12
Operable from multiple points	3C007/JU13
Portable type	3C007/JU14
Stationary type	3C007/JU15
Teaching device in combination with control device	3C007/JU17

## B25J 13/065

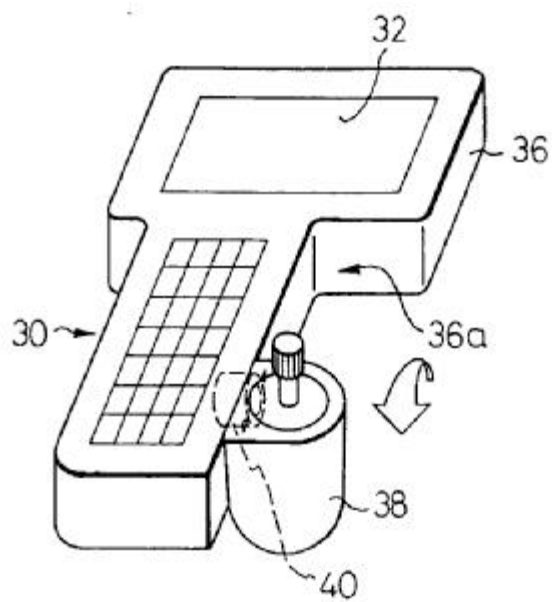
[N: comprising joy-sticks]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/065](#)

JP 3003787



第 2 図

## **B25J 13/08**

**by means of sensing devices, e.g. viewing or touching devices**

### **Definition statement**

*This subclass/group covers:*

Different types of sensors which can be used in the control systems of manipulators.

## **B25J 13/081**

**[N: Touching devices, e.g. pressure-sensitive]**

### **Definition statement**

*This subclass/group covers:*

Contact sensors.

## **B25J 13/082**

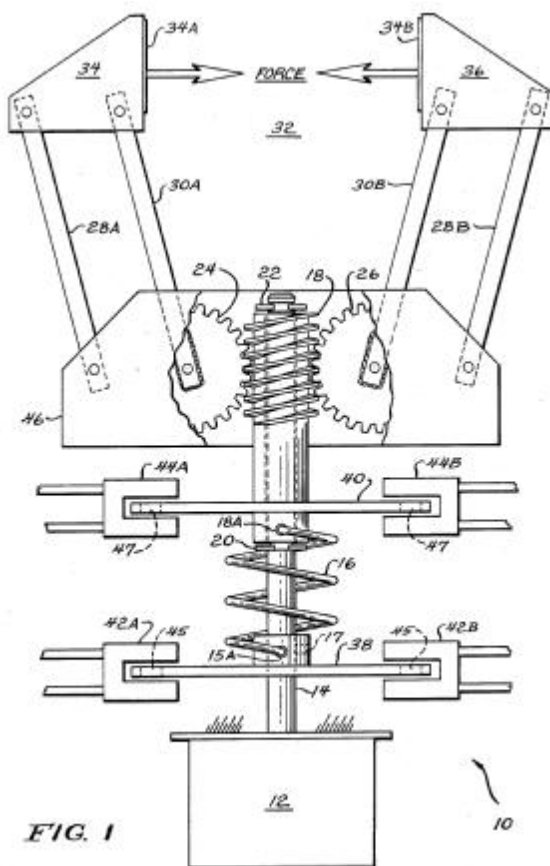
**[N: Grasping-force detectors (in general G01L5/16, G01L5/22)]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/082](#)

US 4600357



## B25J 13/083

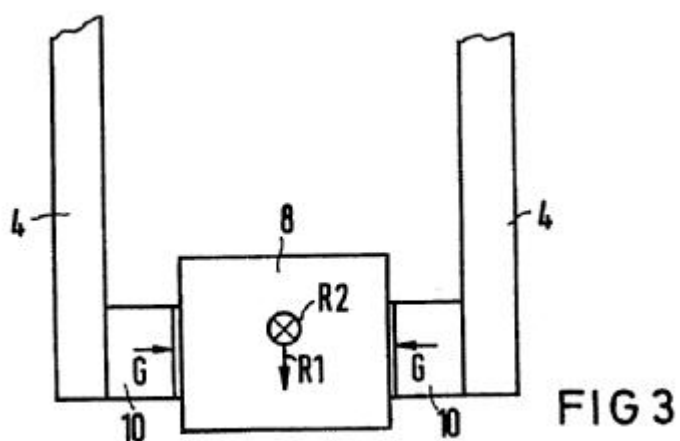
[N: fitted with slippage detectors]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/083](#)

DE 3332147



## B25J 13/084

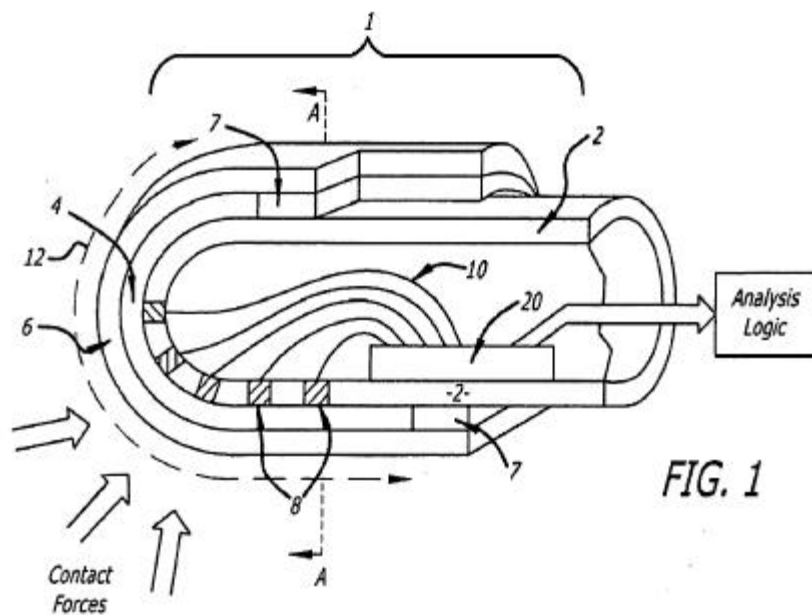
[N: Tactile sensors (in general G01L5/16, G01L5/22)]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/084](#)

WO 2009023334



## B25J 13/085

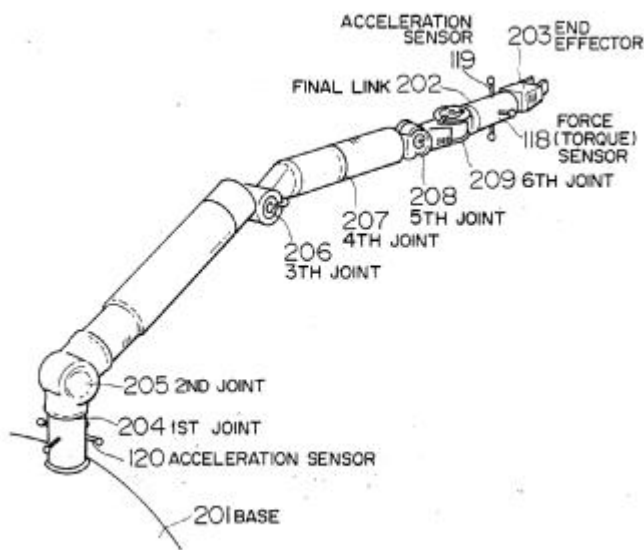
[N: Force or torque sensors (B25J13/082, B25J13/084 take precedence)]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/085](#)

DE 3810691



## B25J 13/086

[N: Proximity sensors]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/086](#)

EP 0518836

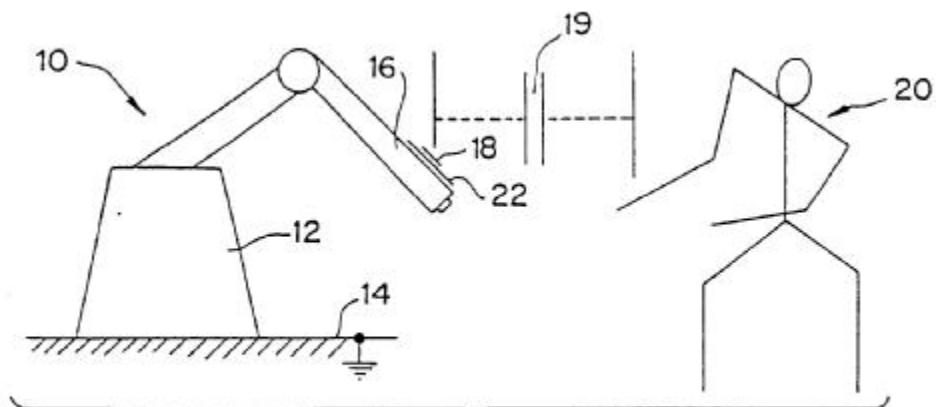


FIG. 1

## B25J 13/087

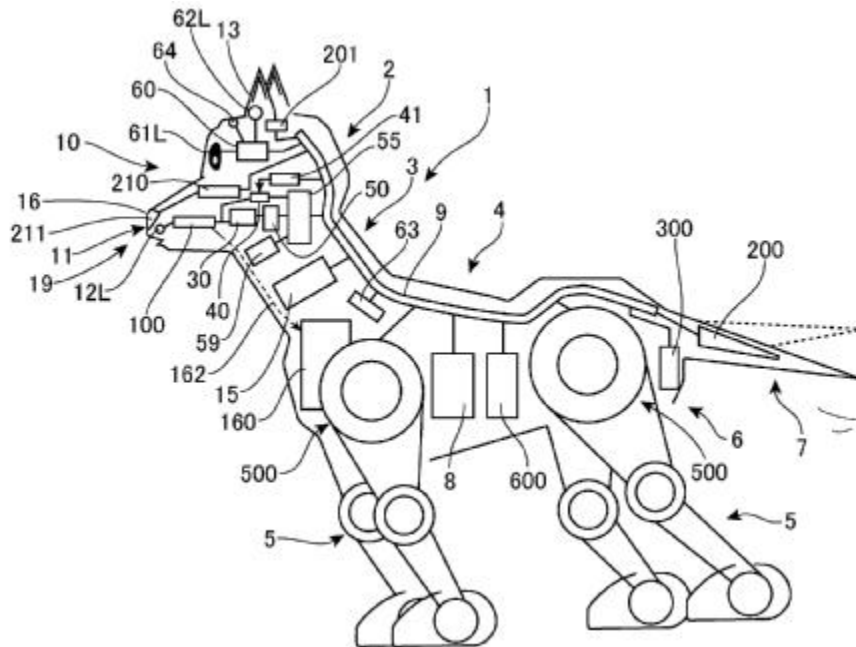
[N: for sensing other physical parameters, e.g. electrical or chemical properties]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/087](#)

WO 2011077730



## B25J 13/088

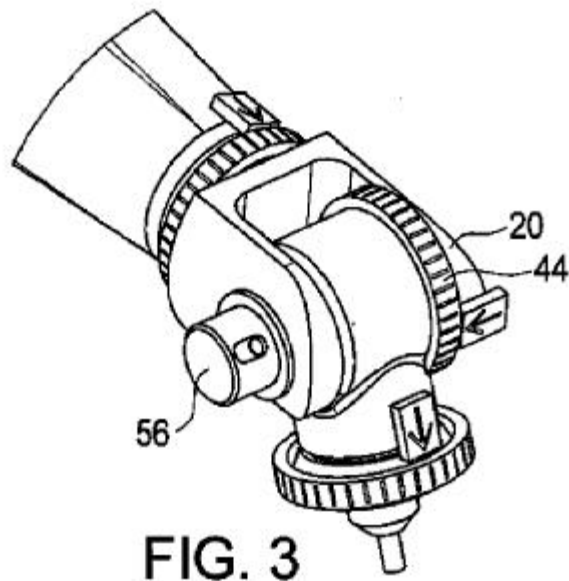
[N: with position, velocity or acceleration sensors]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/088](#)

US 2011098852



## B25J 13/089

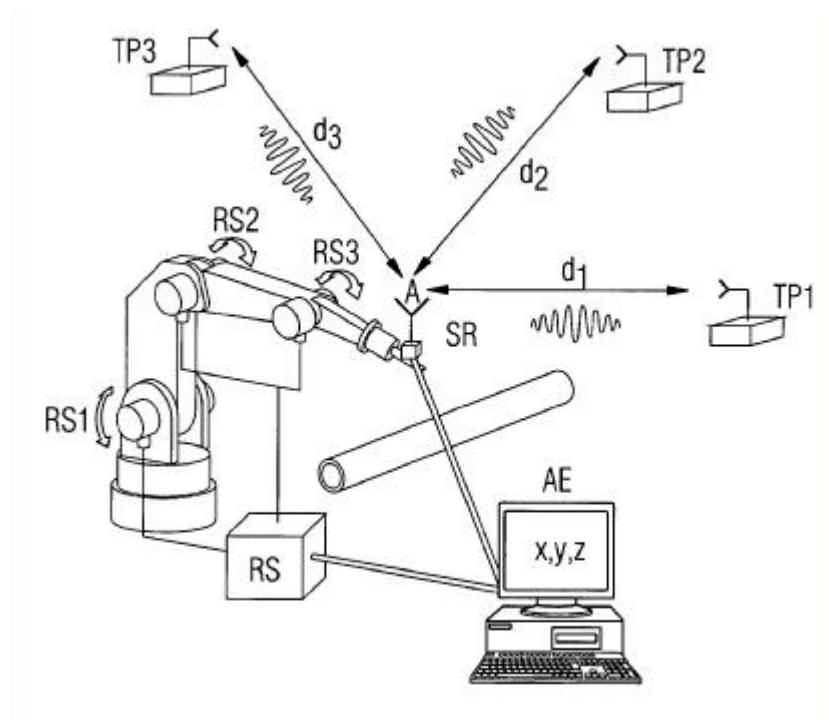
[N: Determining the position of the robot with reference to its environment]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 13/089](#)

DE 102005000732





**Gripping heads [N: and other end effectors (grippers used in machine tools B23Q7/04; gripping members fitted on cranes B66C1/42, B66C1/44; gripping means used in the manufacture of semiconductors [N: H01L21/68707]; gripping means used for mounting electrical components H05K13/04)]**

*This subclass/group covers:*

**B25J 15/0004**

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0004](#)

[illegible]

## Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

Adjusting	Modifying the orientation of a work piece while being gripped
-----------	---

## B25J 15/0009

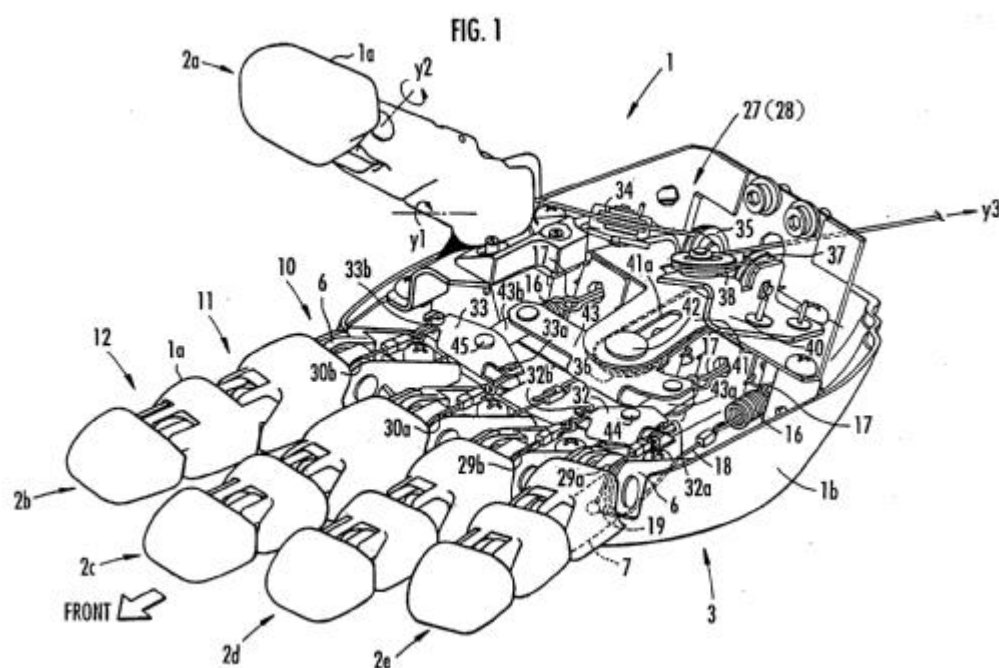
[N: comprising multi-articulated fingers, e.g. resembling a human hand]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0009](#)

EP 1457294



## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Hand prostheses	<a href="#">A61F 2/583</a>
-----------------	----------------------------

## B25J 15/0019

[N: End effectors other than grippers]

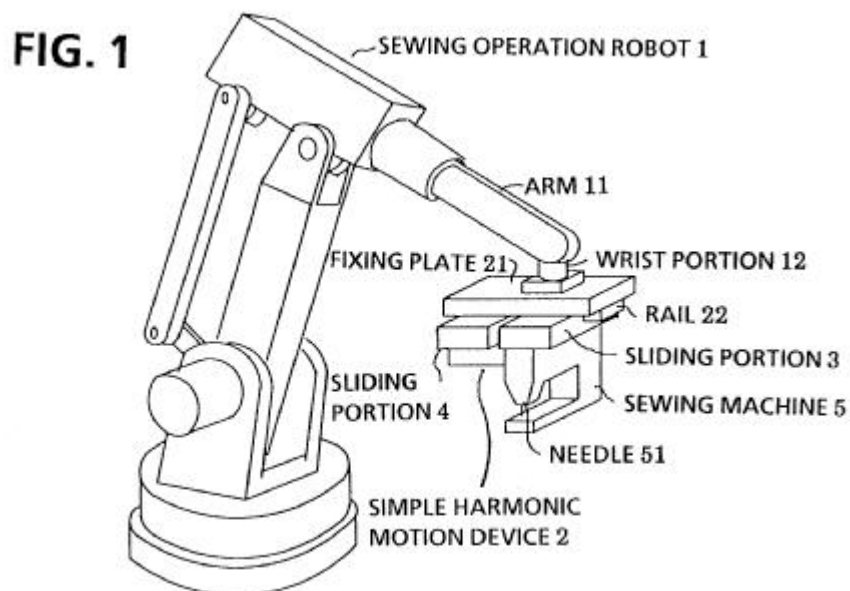
### Definition statement

*This subclass/group covers:*

Any end-effector mounted on a manipulator and which is not a gripper. This includes welding tools, machining tools, spraying tools, screwing tools, medical or surgical tools/instruments, etc.

Illustrative example of subject matter classified in [B25J 15/0019](#)

EP 0520076



## B25J 15/0023

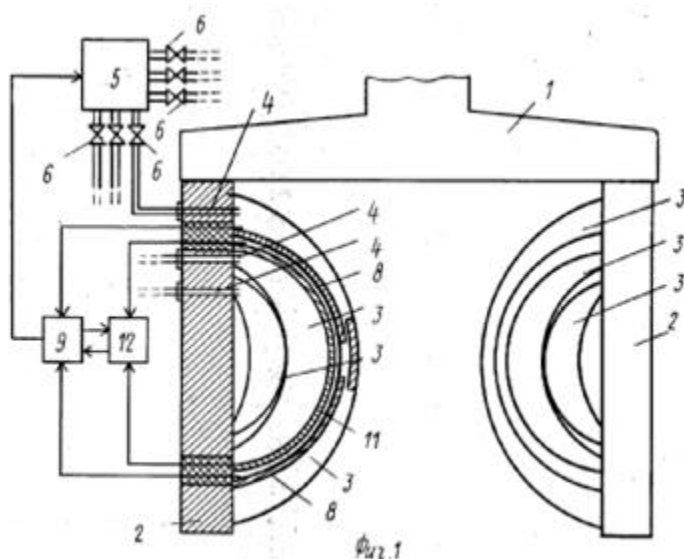
[N: Gripper surfaces directly activated by a fluid (flexible fingers B25J15/12)]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0023](#)

SU 1047680



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for picking up and depositing articles or materials with inflatable picking-up means	<a href="#">B65G 47/908</a>
--	-----------------------------

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Use of fluid pressure	3C007/EV12
Elastic membrane (with open spaces, closed spaces, filled spaces)	3C007/EV14

## B25J 15/0028

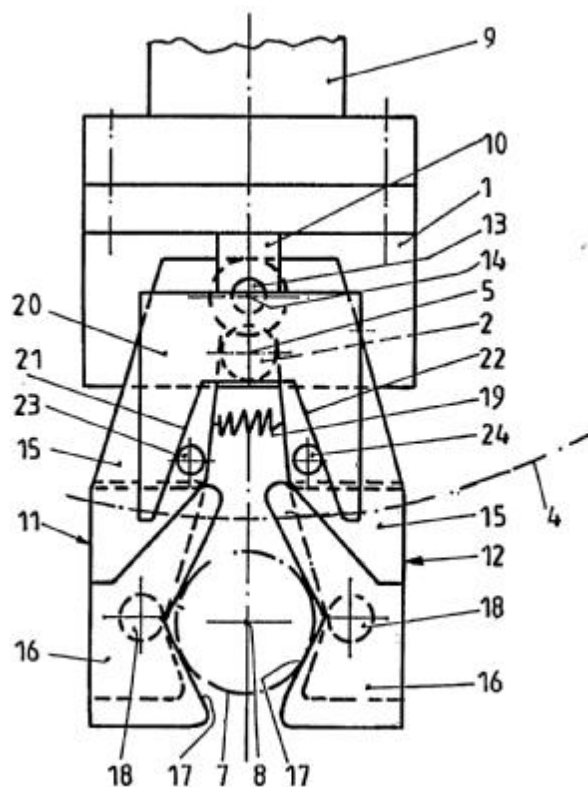
[N: with movable, e.g. pivoting gripping jaw surfaces]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0028](#)

DE 4400354



## References relevant to classification in this group

*This subclass/group does not cover:*

Grippers with jaw surfaces comprising actuating means for moving the gripped objects	<a href="#">B25J 15/0004</a>
--	------------------------------

## B25J 15/0052

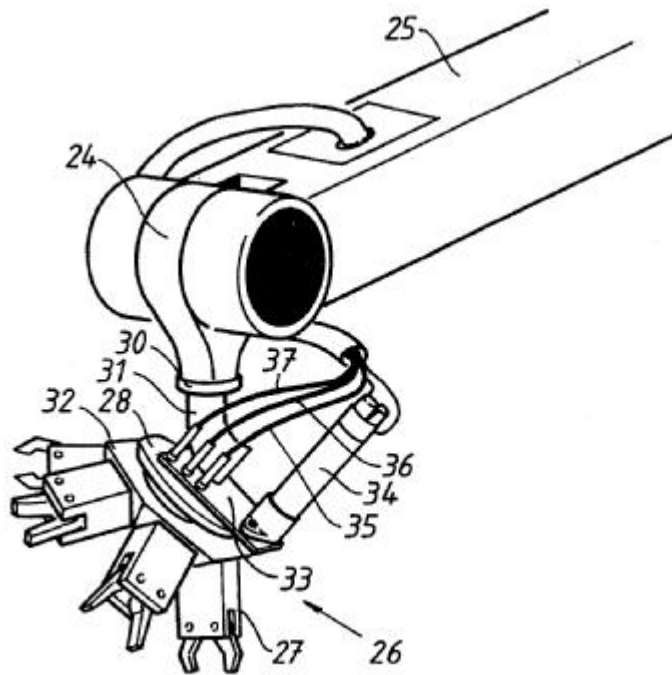
[N: Multiple gripper units]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0052](#)

EP 0094338



## B25J 15/02

**servo-actuated**

### Definition statement

*This subclass/group covers:*

Grippers having actuators for moving holding elements, sensors and a feedback loop for correcting an error on the position, speed or force of the holding elements.

## B25J 15/0206

**[N: comprising articulated grippers]**

### Definition statement

*This subclass/group covers:*

Grippers having pivoting fingers or jaws.

## B25J 15/0213

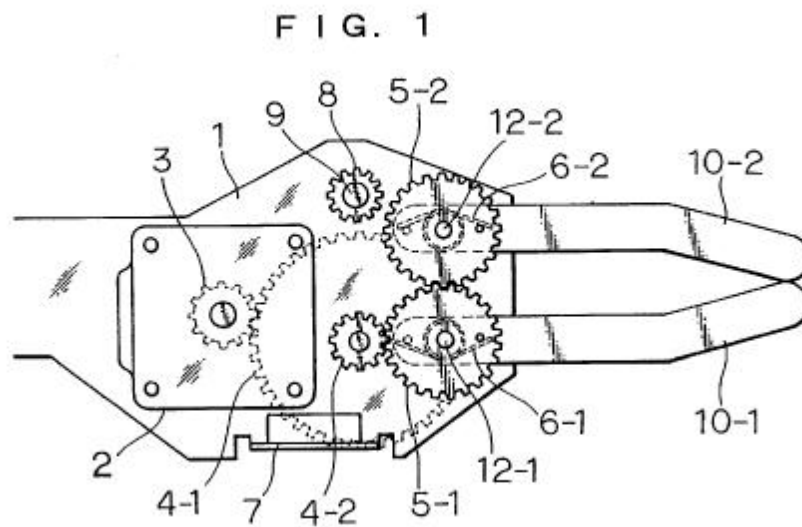
**[N: actuated by gears]**

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0213](#)

US 62217094



## **B25J 15/022**

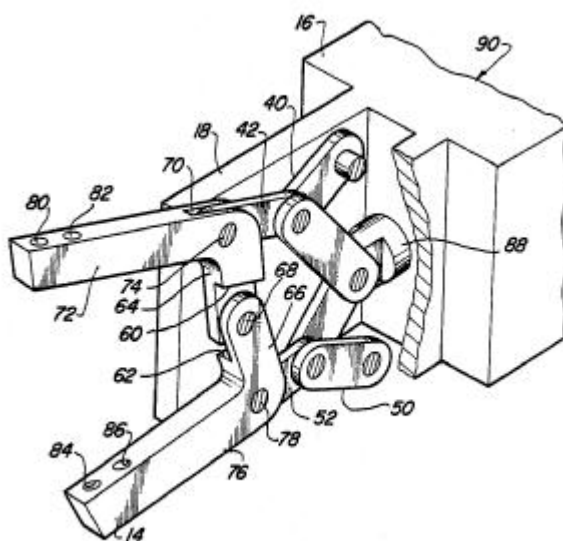
**[N: actuated by articulated links]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/022](#)

US 4728137



## B25J 15/0226

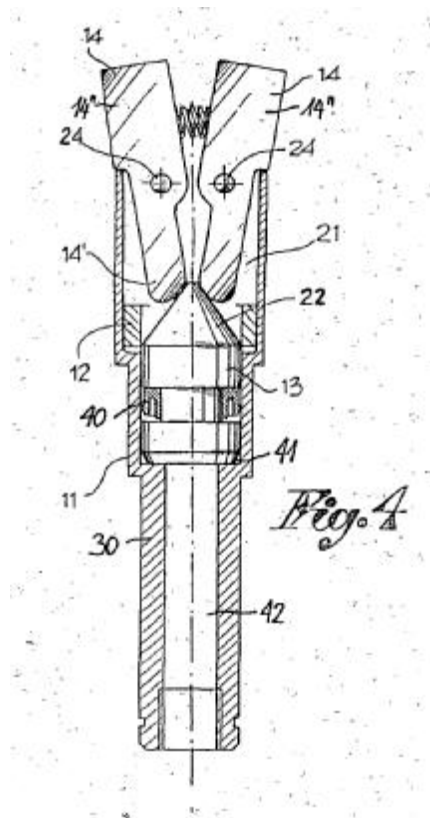
[N: actuated by cams]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0226](#)

DE 29806798 U



## B25J 15/0253

[N: comprising parallel grippers]

### Definition statement

*This subclass/group covers:*

Grippers having fingers or jaws moving in translation.

## B25J 15/026

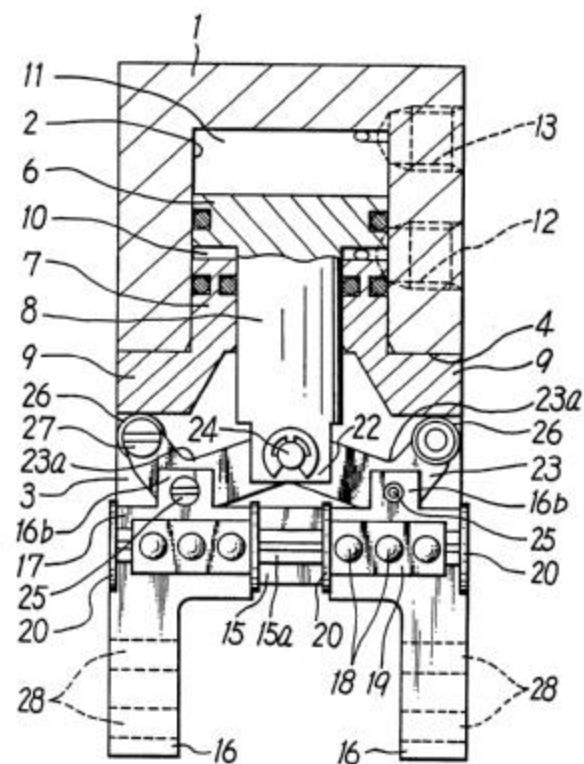
[N: actuated by gears]

### Definition statement



GB 2119894

EP 0293153



## B25J 15/0273

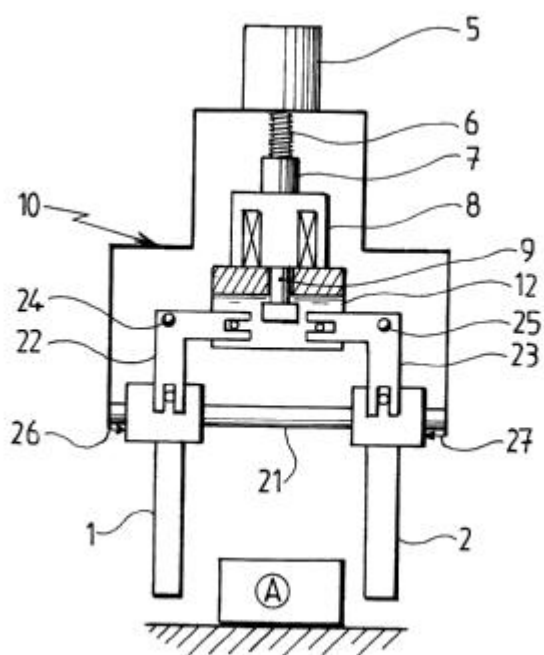
[N: comprising linear guide means]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0273](#)

FR 2816232



## B25J 15/028

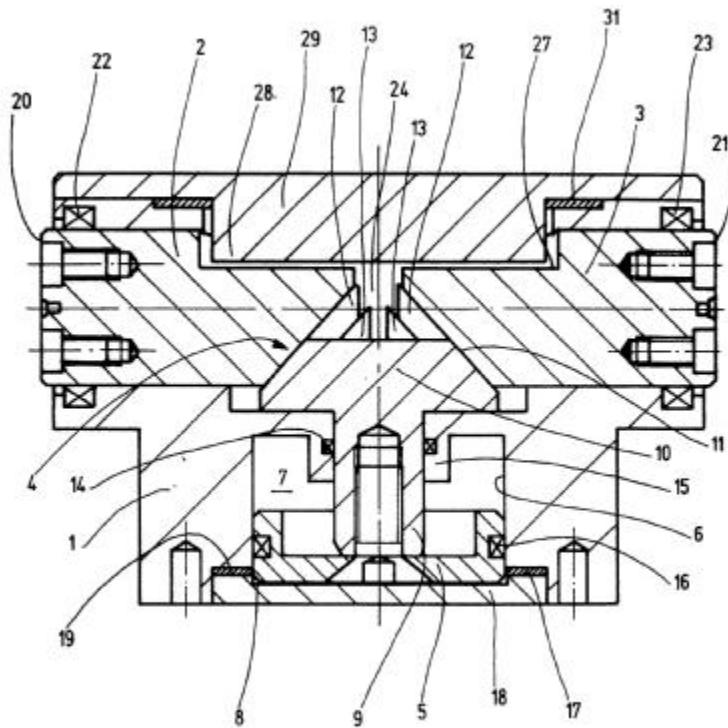
[N: actuated by cams]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/028](#)

DE 19604649



## **B25J 15/04**

**with provision for the remote detachment or exchange of the head or parts thereof**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/04](#)

EP 0288744

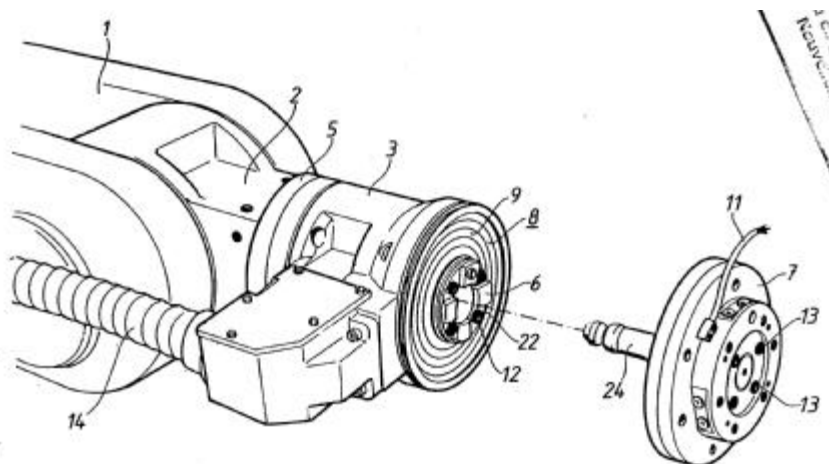


FIG. 4

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Gripping device replacement	3C007/GS00
Conjunction means	3C007/GS01
Ball type	3C007/GS02
Gripping claw type	3C007/GS03
Plug-in type (screw, pin, pile)	3C007/GS04
Twist type/thread connection	3C007/GS05
Magnetic type	3C007/GS06
Joint for power feed / fluid supply	3C007/GS11
Control for hand replacement	3C007/GS19

**B25J 15/0475**

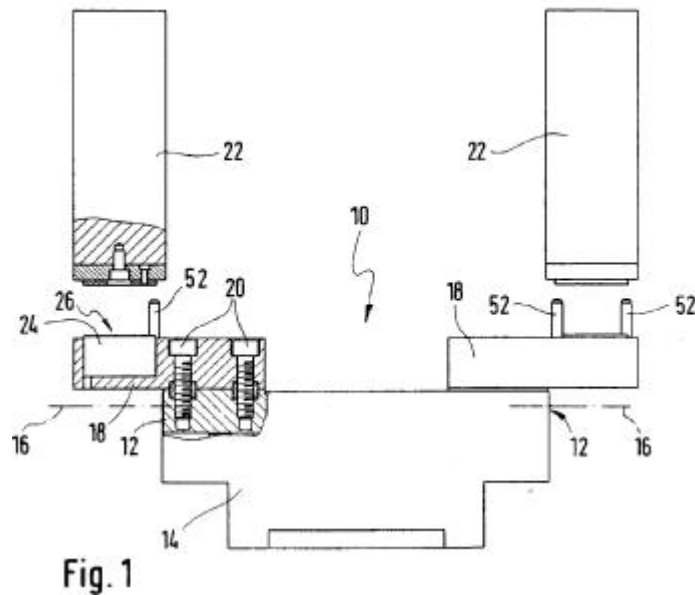
**[N: Exchangeable fingers]**

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0475](#)

EP 1785238



### B25J 15/0491

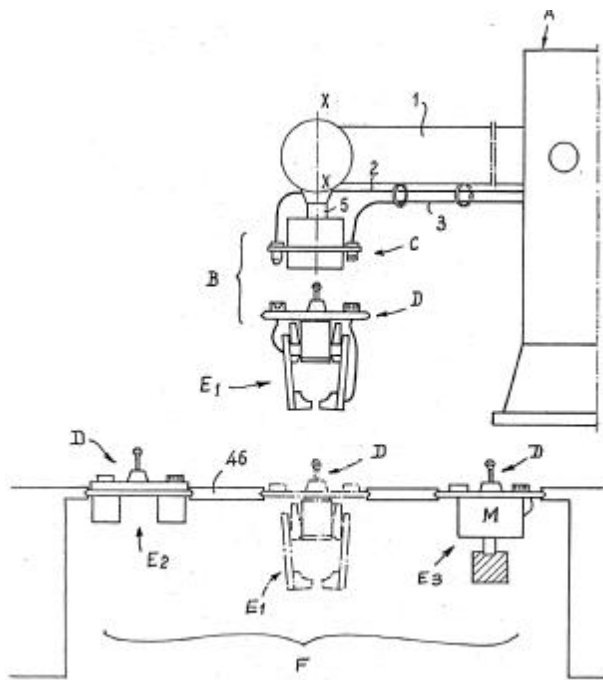
[N: comprising end-effector racks]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0491](#)

EP 0120275



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Hand storage	3C007/GS15
Having moving means	3C007/GS16
Having gripper device extraction or junction facility	3C007/GS17

## B25J 15/06

with vacuum or magnetic holding means

### Definition statement

*This subclass/group covers:*

Grippers holding an object by suction or magnetic force.

### Relationship between large subject matter areas

A documents is classified in [B25J 15/06](#) when it both discloses vacuum

holding means and magnetic holding means (in different embodiments or combined in one embodiment). In this case, and provided that the inventive concept is independent of the very nature of the holding means, the document should be classified in [B25J 15/06](#) only and not in the subgroups [B25J 15/0608](#) and [B25J 15/0616](#). If the inventive concept of a document directly concerns the design of vacuum holding means, respectively of magnetic holding means, the document should be classified in [B25J 15/0616](#), respectively in [B25J 15/0608](#).

## B25J 15/0608

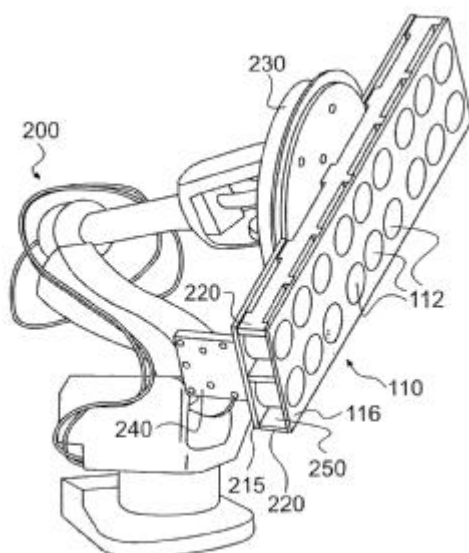
[N: with magnetic holding means]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0608](#)

DE 102009015345



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Magnetic work holders	<a href="#">B25B 11/002</a>
Devices for picking-up and depositing articles incorporating electrostatic or magnetic grippers	<a href="#">B65G 47/92</a>
Load-engaging elements by magnetic means attached to lifting or lowering gear of cranes	<a href="#">B66C 1/04</a>



## B25J 15/0616

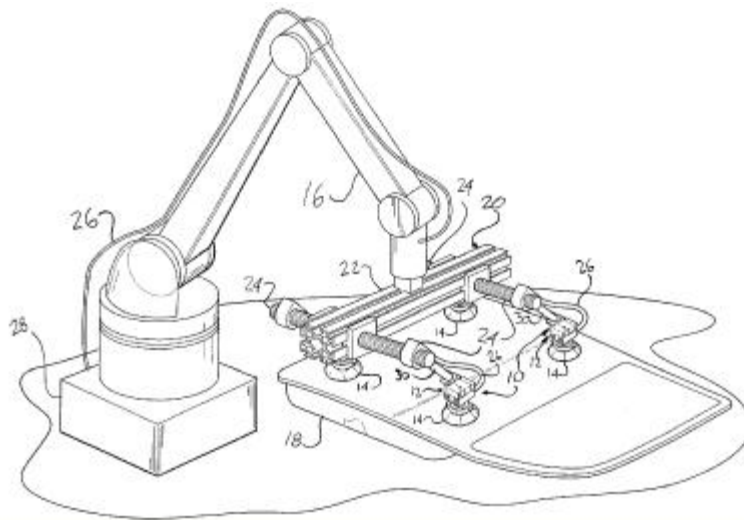
[N: with vacuum]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/0616](#)

US 2008202602



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Vacuum work holders	<a href="#">B25B 11/005</a>
Devices for picking-up and depositing articles incorporating pneumatic, e.g. suction, grippers	<a href="#">B65G 47/91</a>
Separating articles from piles using suction grippers	<a href="#">B65H 3/0808</a>
Load-engaging elements with suction means attached to lifting or lowering gear of cranes	<a href="#">B66C 1/02</a>
Suction cups for attaching purposes	<a href="#">F16B 47/00</a>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Vacuum absorption	3C007/FS01
Structure of absorption part	3C007/FT00
Purpose of absorption device	3C007/FU00

### Synonyms and Keywords

In patent documents the following expressions/words (EN)"vacuum", "suction", "sucking", (FR)"vide", "dépression", "aspir+", (DE)"saug+", and "vakuum" are often used as synonyms.

In patent documents the following expressions/words (EN) "cup", "pad", (DE) "napf", and (FR)"ventouse" are often used as synonyms.

## B25J 15/08

**having finger members (B25J15/02, B25J15/04 take precedence)**

### Definition statement

*This subclass/group covers:*

Grippers having a plurality of finger members not covered by [B25J 15/02](#).

## B25J 15/10

**with three or more finger members [N: (B25J15/0009 takes precedence)]**

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/10](#)

US 2003102640



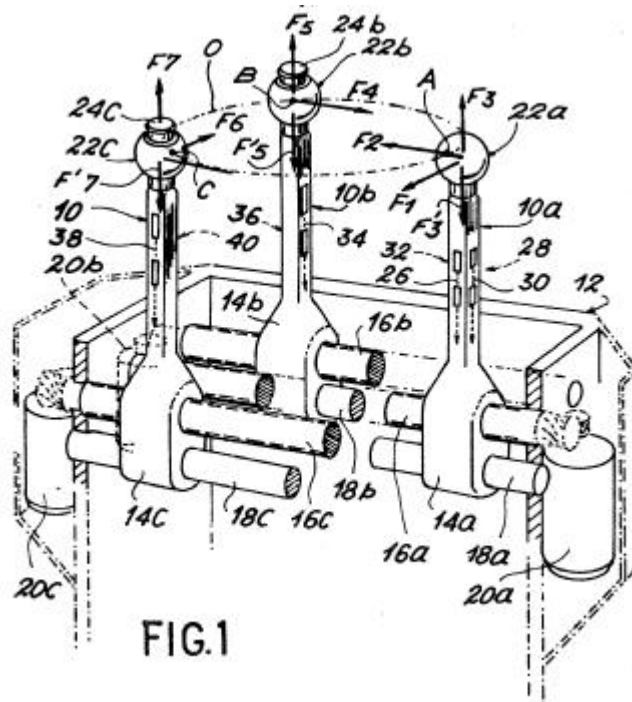


FIG.1

## B25J 15/106

[N: moving in parallel relationship]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/106](#)

US 5011207

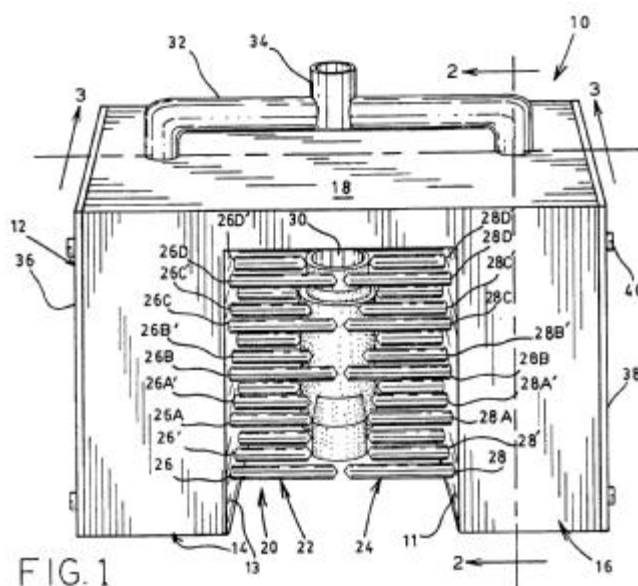


FIG.1

## Informative references

Attention is drawn to the following places, which may be of interest for search:

Vices having a plurality of parts with linear movement	<a href="#">B25B 1/2421</a>
--	-----------------------------

## B25J 15/12

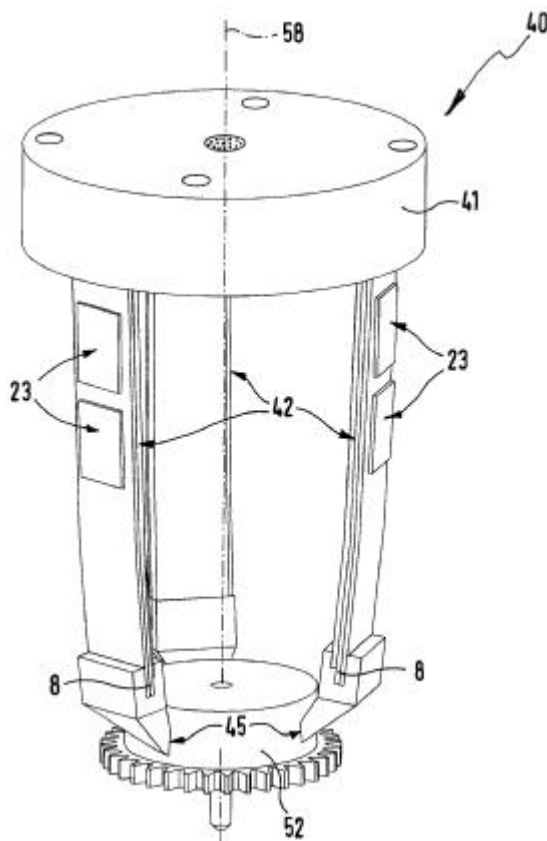
with flexible finger members

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 15/12](#)

DE 102004034537



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Devices for picking-up and depositing articles with inflatable picking-up	<a href="#">B65G 47/908</a>
---	-----------------------------

means	
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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Wholly flexible finger member	3C007/ES10
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### **Special rules of classification within this group**

Fingers directly actuated by a fluid should additionally be classified in [B25J 15/0023](#).

## **B25J 17/00**

### **Joints**

#### **Definition statement**

*This subclass/group covers:*

Devices for linking two parts of a manipulator while allowing a freedom of movement between these two parts.

## **B25J 17/02**

### **Wrist joints**

#### **Definition statement**

*This subclass/group covers:*

Joints specially adapted for linking an end effector to the manipulator.

## **B25J 17/0208**

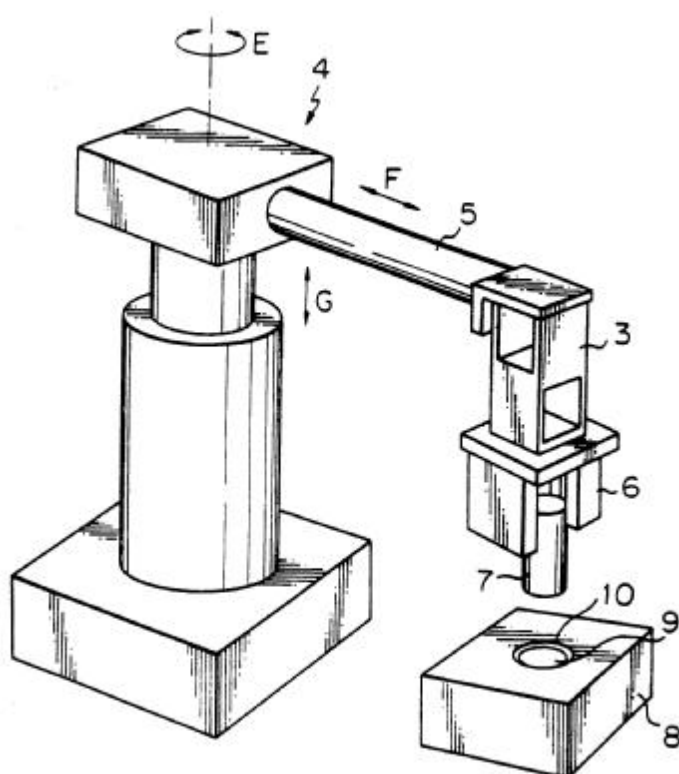
### **[N: Compliance devices]**

#### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 17/0208](#)

US 5207554



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Machines for aligning articles to be assembled	<a href="#">B23P 19/00C</a>
Machines for connecting objects by press fit	<a href="#">B23P 19/02</a>

## Special rules of classification within this group

Passive compliant mechanisms avoiding breaking of a robot arm when this robot hurts an obstacle should also additionally classified in [B25J 19/063](#).

## B25J 17/0216

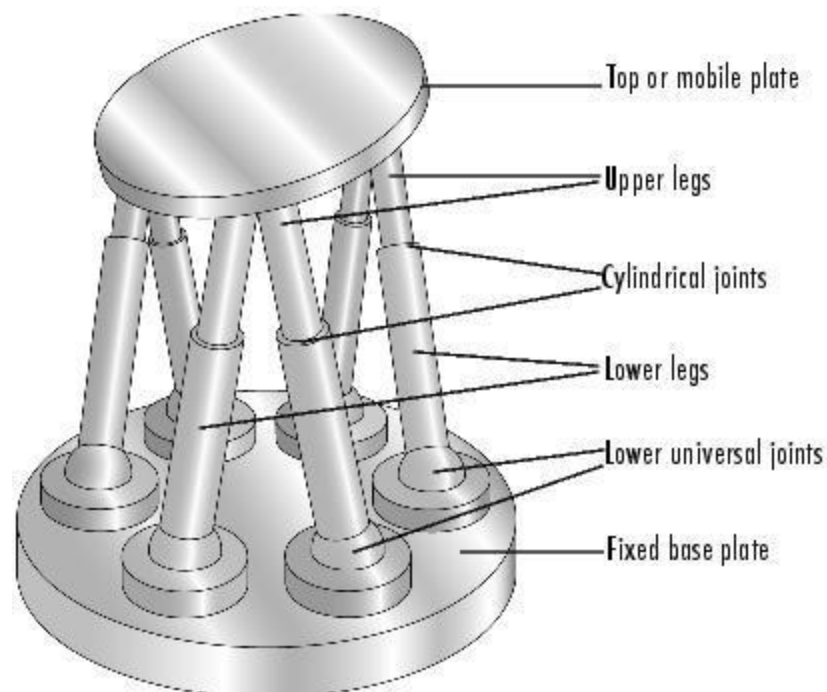
[N: comprising a stewart mechanism]

## Definition statement

This subclass/group covers:

Exclusively parallel kinematics manipulators having 6 linear actuators linked to a base and a moving platform by means of universal or ball joints and allowing 6 degrees of freedom for the platform.

Illustrative example of subject matter classified in [B25J 17/0216](#)



## References relevant to classification in this group

*This subclass/group does not cover:*

Other type of 3D parallel kinematics manipulators	<a href="#">B25J 17/0266</a>
2D parallel kinematics manipulators	<a href="#">B25J 9/106</a>
Control of parallel manipulators	<a href="#">B25J 9/1623</a>

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Machine tools having parallel kinematics	<a href="#">B23Q 1/5462</a>
Gearings comprising primarily only links or levers, with movements in three dimensions	<a href="#">F16H 21/46</a>



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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Parallel link type manipulator	3C007/BS24
--------------------------------	------------

## Synonyms and Keywords

In patent documents the following expressions/words "parallel manipulators", "parallel robots" and "parallel kinematics" are often used as synonyms.

## B25J 17/0241

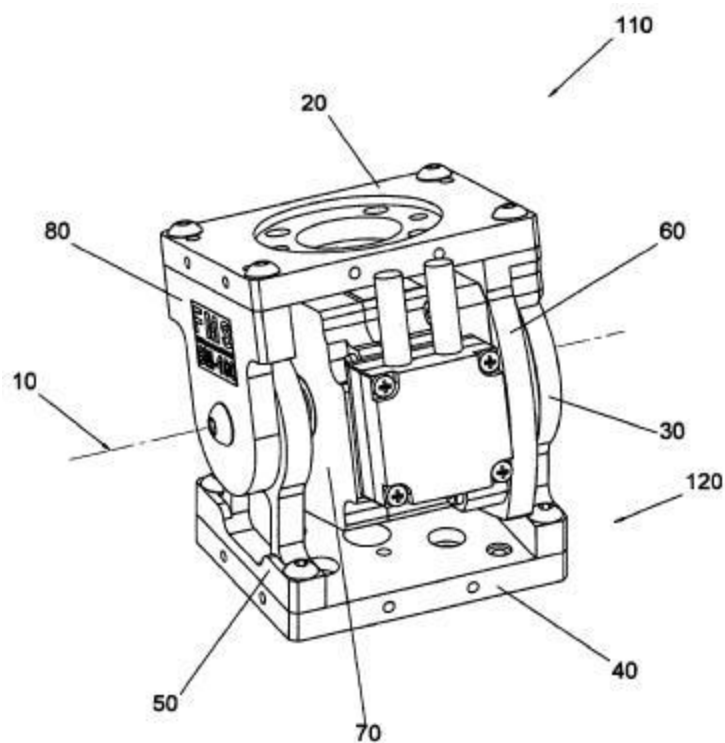
[N: One-dimensional joints]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 17/0241](#)

DE 202011004164 U



## B25J 17/025

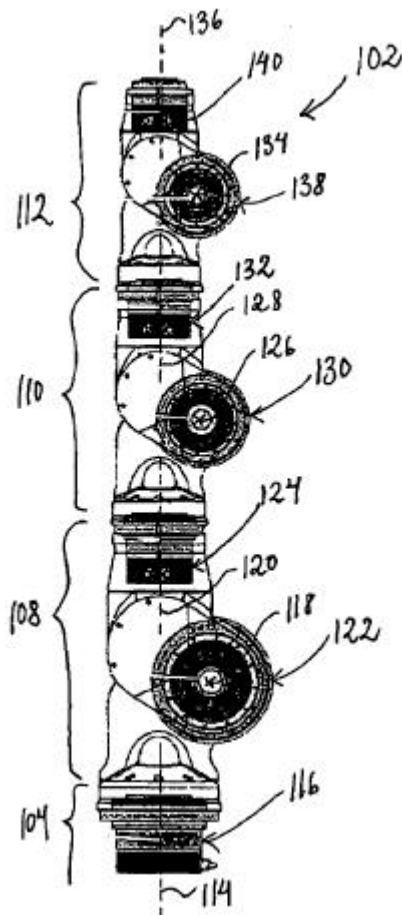
**[N: mounted in series]**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 17/025](#)

WO 2011003451



**Special rules of classification within this group**

Manipulators having a high numbers of joints mounted in series should additionally be classified in [B25J 9/06](#).

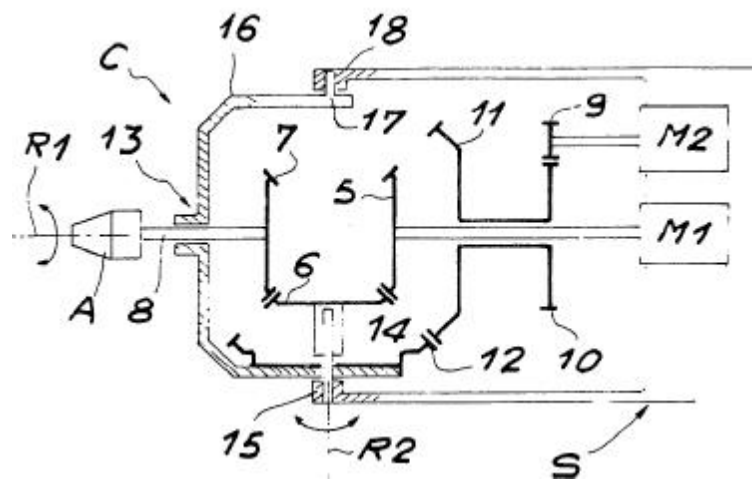
**B25J 17/0258**

**[N: Two-dimensional joints]**

**Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 17/0258](#)



## B25J 17/0266

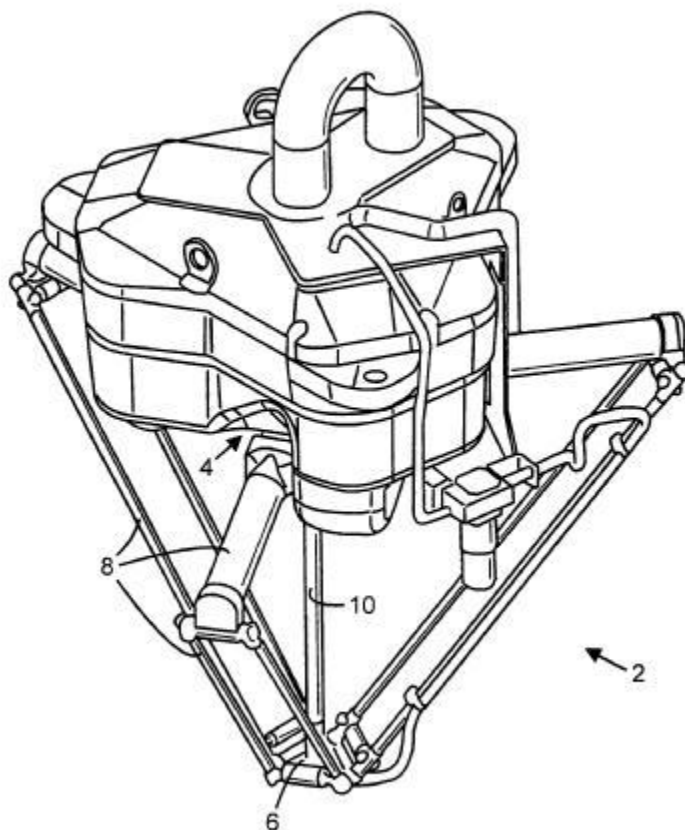
[N: comprising more than two actuating or connecting rods]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 17/0266](#)

WO 0035640



## References relevant to classification in this group

*This subclass/group does not cover:*

Stewart mechanism (6 linears actuators linked to the base and the platform by universal joints and allowing 6 degrees of freedom for the platform)	<a href="#">B25J 17/0216</a>
2D parallel manipulators (movements in one plane only)	<a href="#">B25J 9/106</a>
Control of parallel manipulators	<a href="#">B25J 9/1623</a>

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Machine tools having parallel kinematics	<a href="#">B23Q 1/5462</a>
Gearings comprising primarily only links or levers, with movements in three dimensions	<a href="#">F16H 21/46</a>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Parallel link type manipulator	3C007/BS24
--------------------------------	------------

## Synonyms and Keywords

In patent documents the following expressions/words "parallel manipulators", "parallel robots" and "parallel kinematics" are often used as synonyms.

## B25J 17/0275

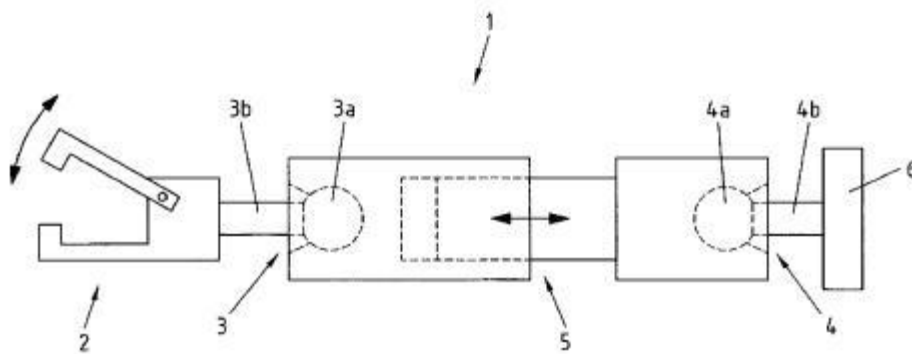
[N: Universal joints, e.g. Hooke, Cardan, ball joints]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 17/0275](#)

WO 2007063006



## B25J 17/0283

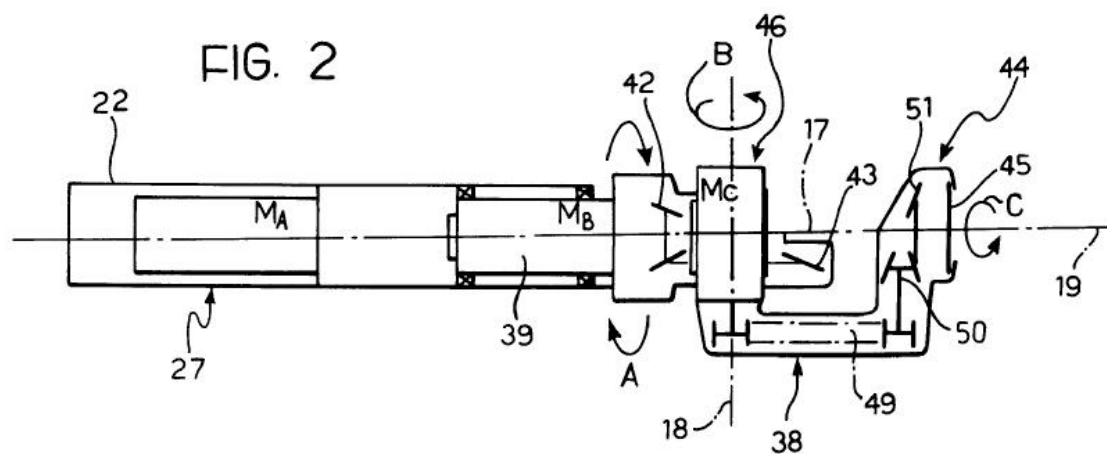
[N: Three-dimensional joints]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 17/0283](#)

EP 0479739



## B25J 18/00

Arms

### Definition statement

*This subclass/group covers:*

Main elongated parts of manipulators.

## B25J 18/002

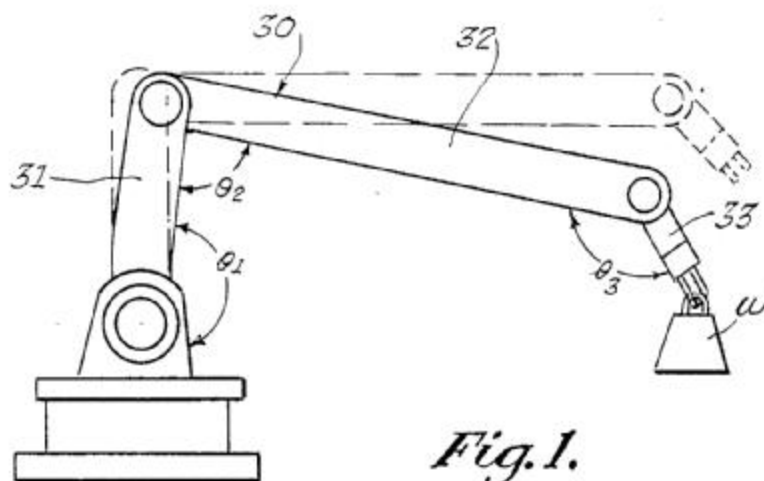
[N: comprising beam bending compensation means]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 18/002](#)

US 4606691



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Accessories fitted to machine tools; Weight and flexion compensation	<a href="#">B23Q 11/001</a>
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### Special rules of classification within this group

Control aspects should additionally be classified in [B25J 9/1638](#).

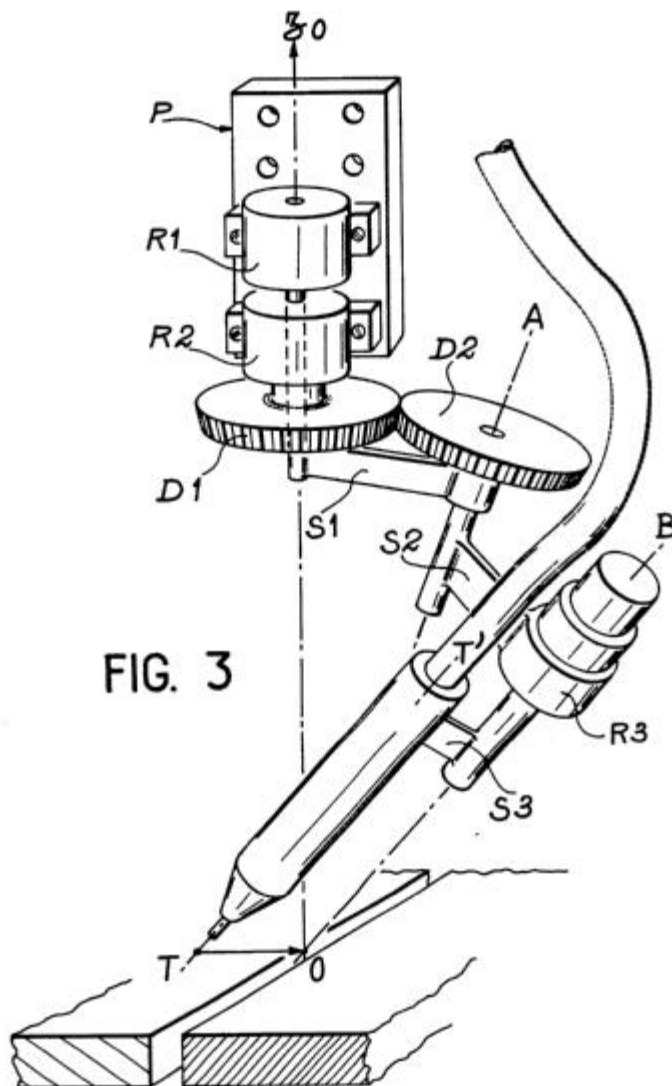
## B25J 18/007

[N: the end effector rotating around a fixed point]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 18/007](#)



### Synonyms and Keywords

In patent documents the following expression/word "spherical robot" is often used.

### B25J 18/02

#### extensible

### Definition statement

*This subclass/group covers:*

This group covers manipulator arms having a variable length.

## B25J 18/025

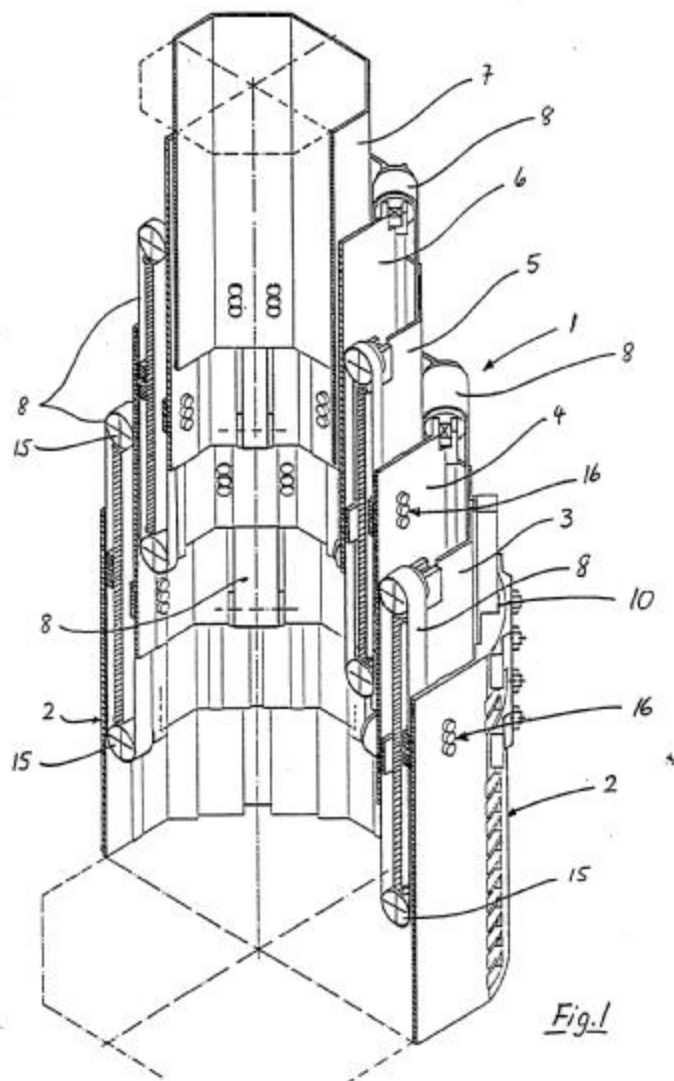
[N: telescopic]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 18/025](#)

EP 0362680



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Telescopic jib-cranes	<a href="#">B66C 23/701</a>
-----------------------	-----------------------------



Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Expandable and contractible	3C007/CU023C007/CV02
Telescopic type	3C007/CU033C007/CW02

## B25J 18/04

rotatable

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 18/04](#)

WO 9639944

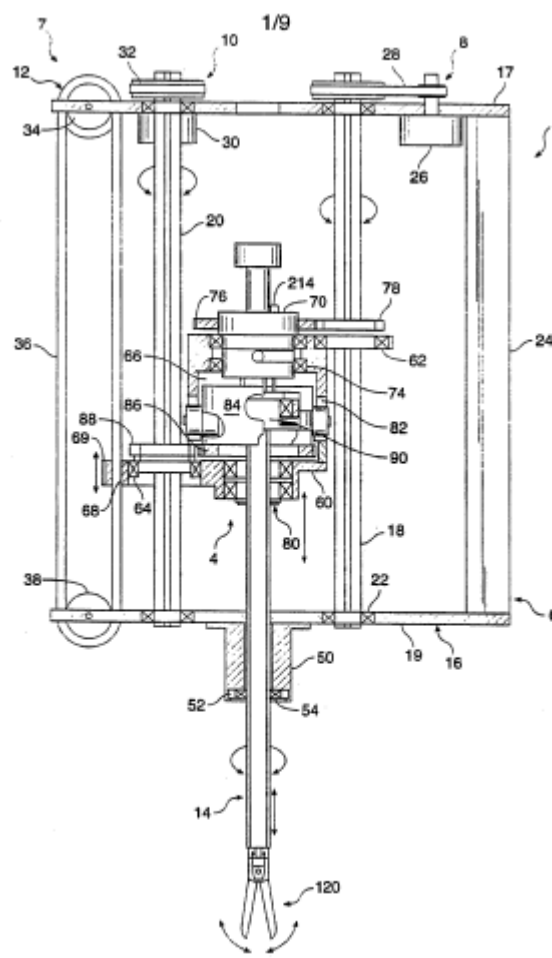


FIG. 1

## Special rules of classification within this group

SCARA robots should additionally be classified in [B25J 9/042](#).

## B25J 18/06

flexible

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 18/06](#)

EP2335884

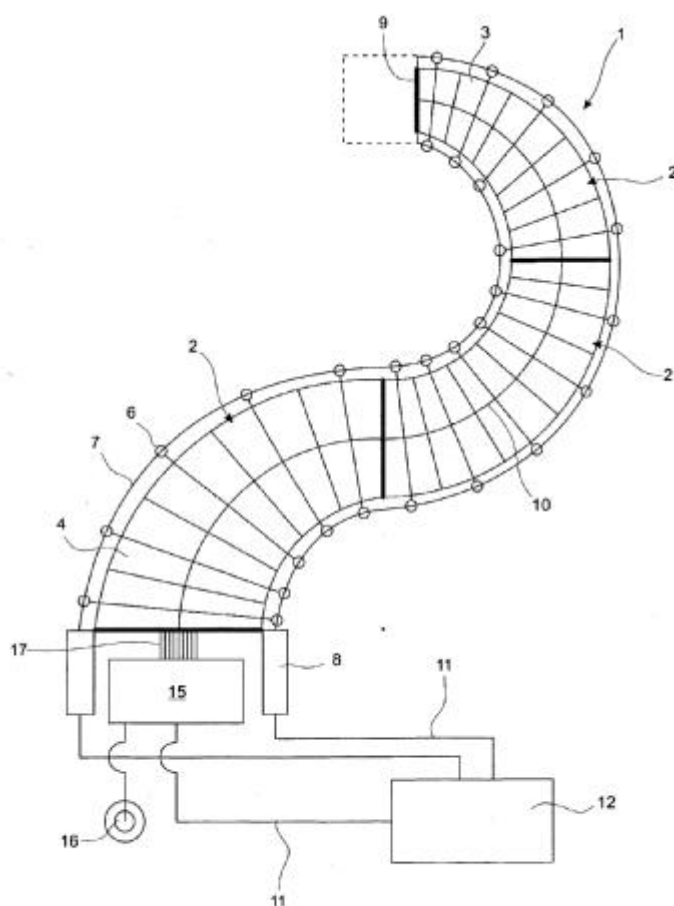


Fig. 1

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Snake-shaped robots	3C007/BS17
---------------------	------------

### **Special rules of classification within this group**

Manipulator arms being flexible by means of a large number of articulations must additionally be classified in [B25J 9/06](#).

## **B25J 19/00**

**Accessories fitted to manipulators, e.g. for monitoring, for viewing; Safety devices combined with or specially adapted for use in connection with manipulators (safety-devices in general F16P; protection against radiation in general G21F)**

### **Definition statement**

*This subclass/group covers:*

This group covers all accessories for manipulators, i.e. components of manipulators not directly intended for structure, actuation or control functions.

## **B25J 19/0004**

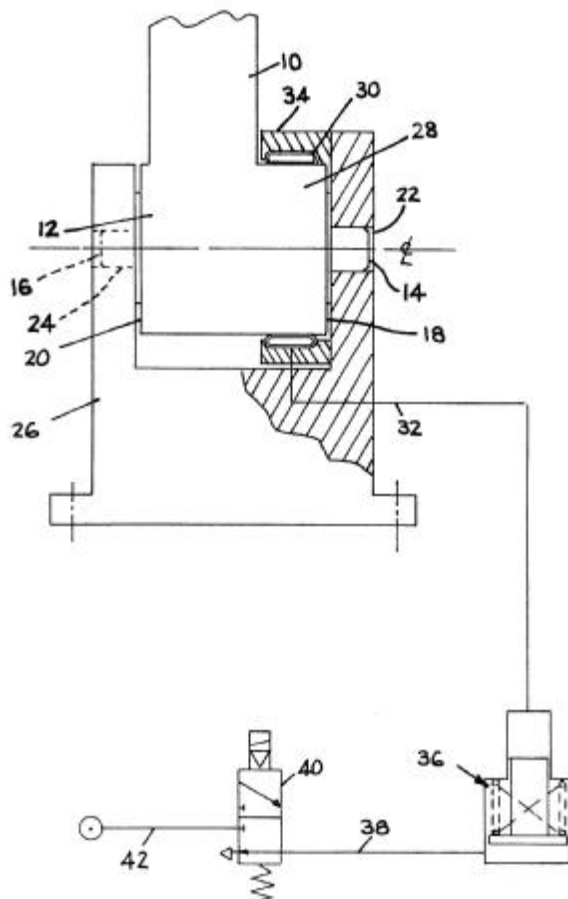
**[N: Braking devices (brakes in general F16D)]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/0004](#)

EP 0109252



manipulator.

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Load balance mechanism	3C007/CY21
------------------------	------------

## B25J 19/0012

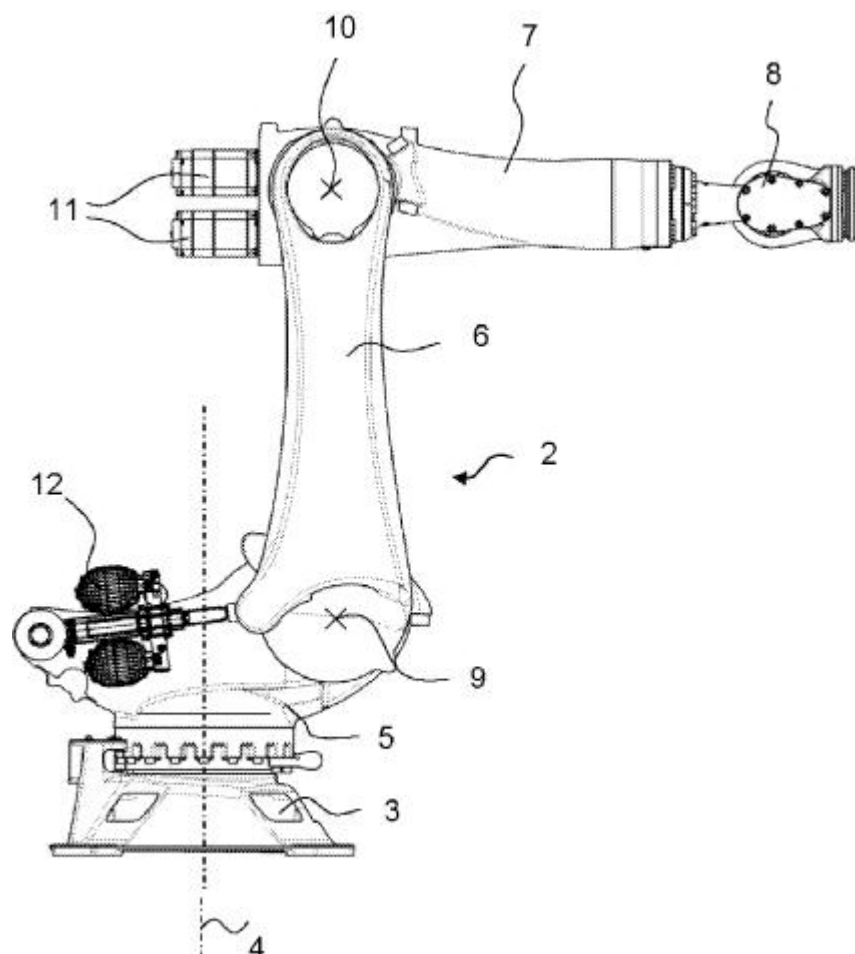
[N: using fluidic devices]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/0012](#)

EP 2301727



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Load balance mechanism by fluid pressure	3C007/CY24
--	------------

## B25J 19/0016

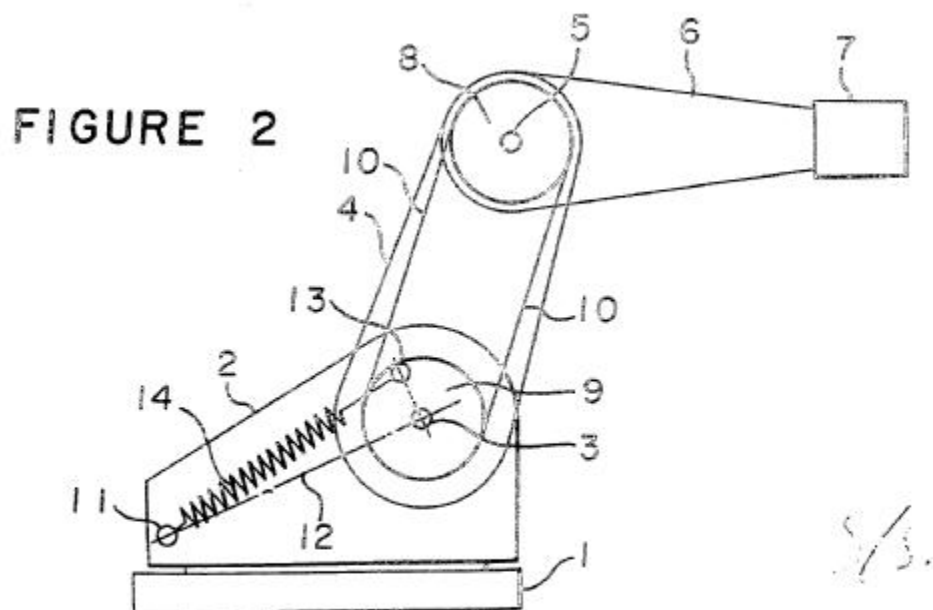
[N: using springs]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/0016](#)

GB 2114536



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Springs; shock-absorbers; means for damping vibration	<a href="#">F16F</a>
---	----------------------

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Load-balancing by springs	3C007/CY23
---------------------------	------------

## B25J 19/002

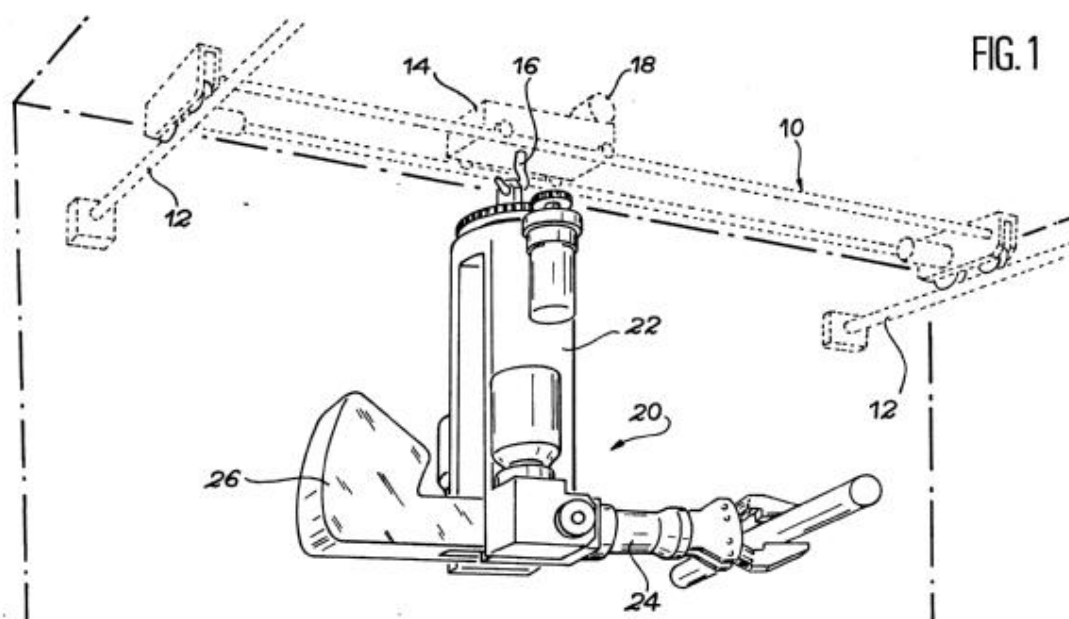
[N: using counterweights]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/002](#)

EP 0392926



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Load balance mechanism; providing balance weight	3C007/CY22
--	------------

## Synonyms and Keywords

In patent documents the following expressions/words (DE)"gegengewicht", "ausgleichgewicht" and (FR)"contrepoids" are often used as synonyms.

## B25J 19/0025

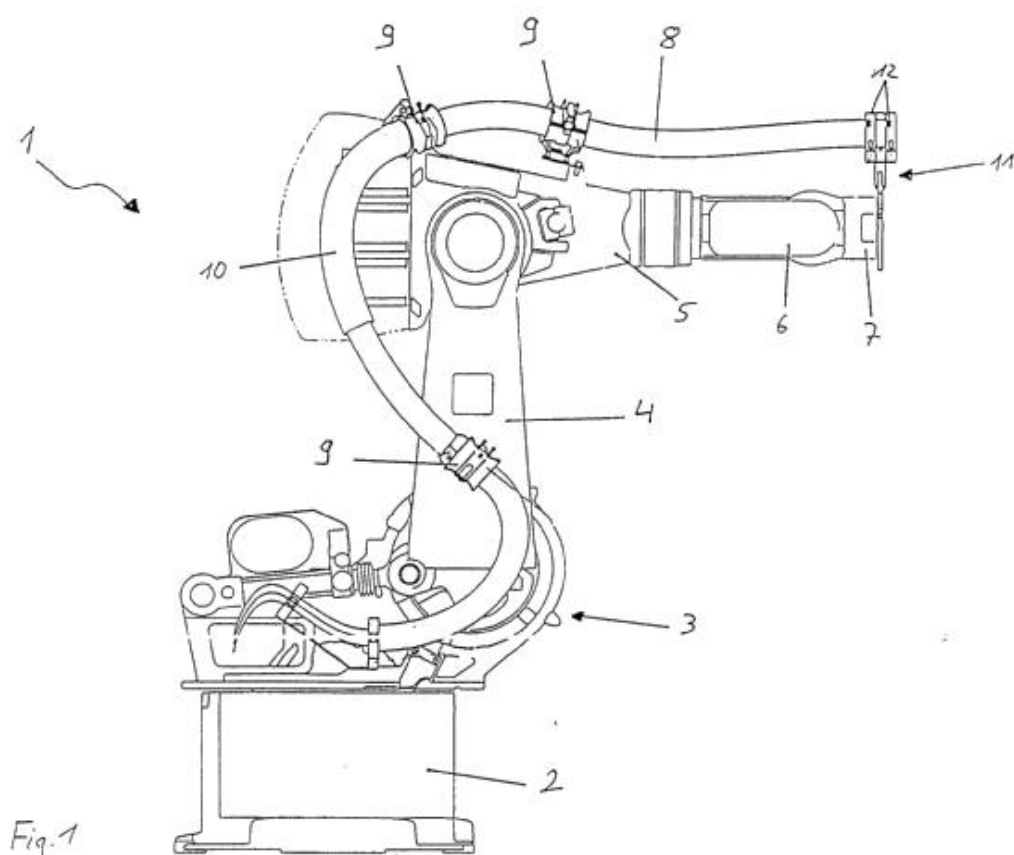
[N: Means for supplying energy to the end effector]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/0025](#)

DE 20022990 U



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Arrangements of means for	<a href="#">B66C 13/12</a>
---------------------------	----------------------------



transmitting pneumatic, hydraulic, or electric power to movable parts of a crane	
Supports for pipes, cables or protective tubing	<a href="#">F16L 3/00</a>
Arrangements of electric cables or lines between relatively-movable parts	<a href="#">H02G 11/00</a>

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Cable disposition along external main body surface	3C007/CY07
--	------------

## Synonyms and Keywords

In patent documents the following expressions/words (EN) "cable", "line", "pipe", "hose", "umbilical member", (DE) "energieversorgung", "kabel", "schlauch", (FR) "alimentation en énergie", are often used as synonyms.

## B25J 19/0029

**[N: arranged within the different robot elements]**

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/0029](#)

EP 1852225



## B25J 19/0037

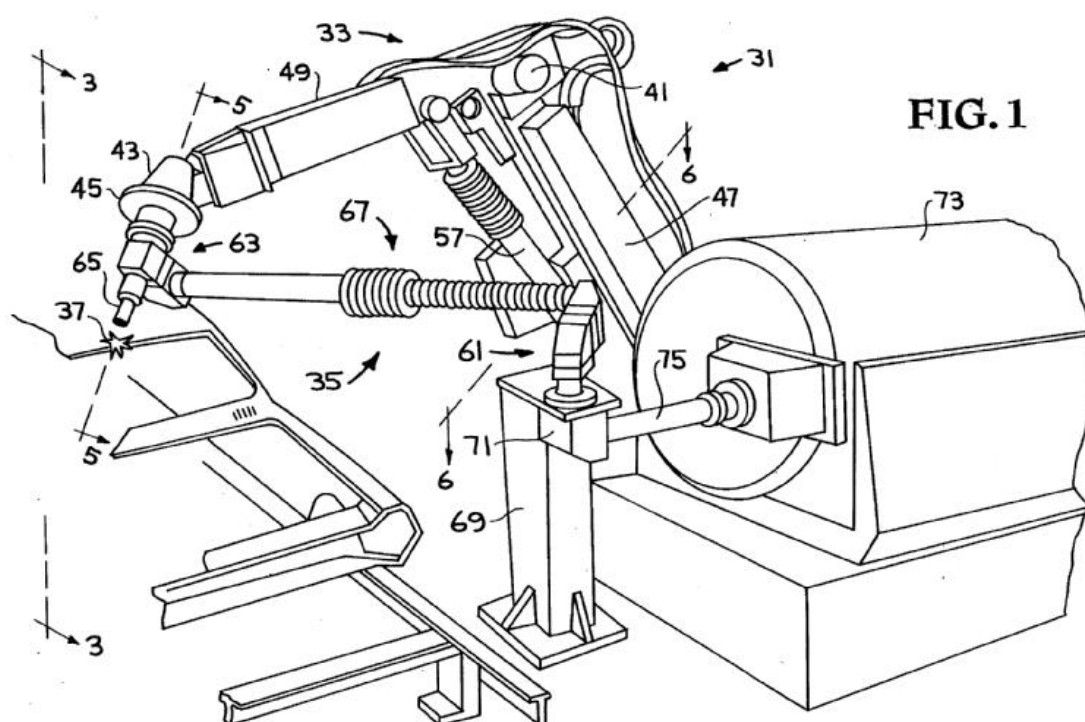
[N: comprising a light beam pathway, e.g. laser]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/0037](#)

US 4667081



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Robots for moving a laser beam	<a href="#">B23K 26/10B</a>
--------------------------------	-----------------------------

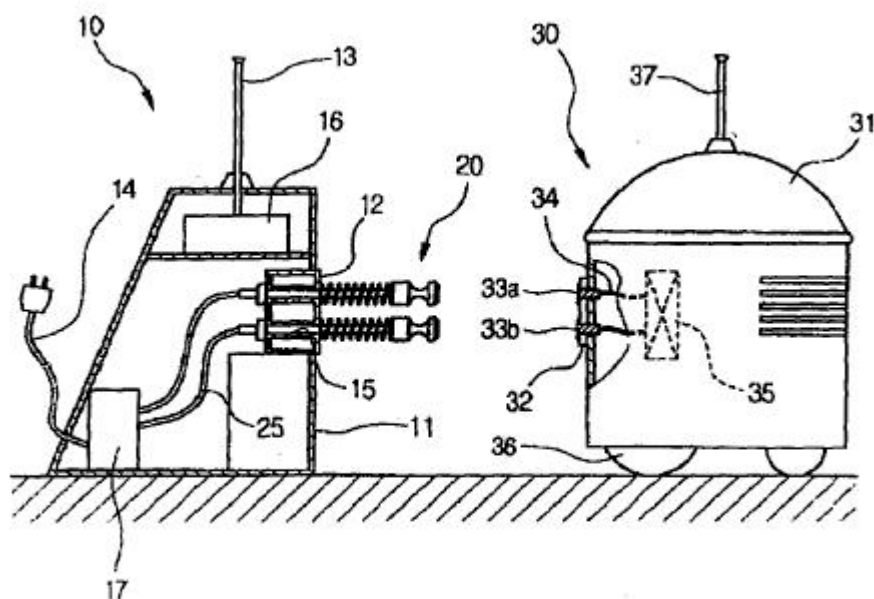
## B25J 19/005

[N: using batteries, e.g. as a back-up power source]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/005](#)



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Battery	3C007/HS09
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## Synonyms and Keywords

In patent documents the following expressions/words "energy cell", "accumulator" and "power source" are often used as synonyms.

## B25J 19/0054

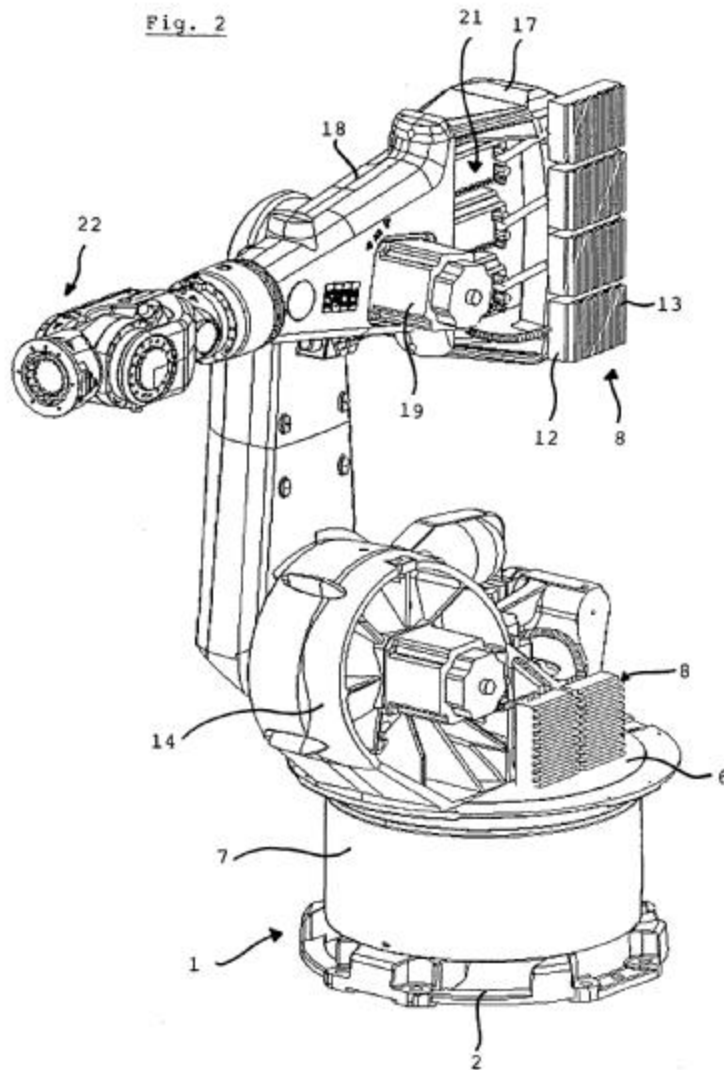
### [N: Cooling means]

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/0054](#)

DE 29711523 U



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Heat radiation / cooling	3C007/CY34
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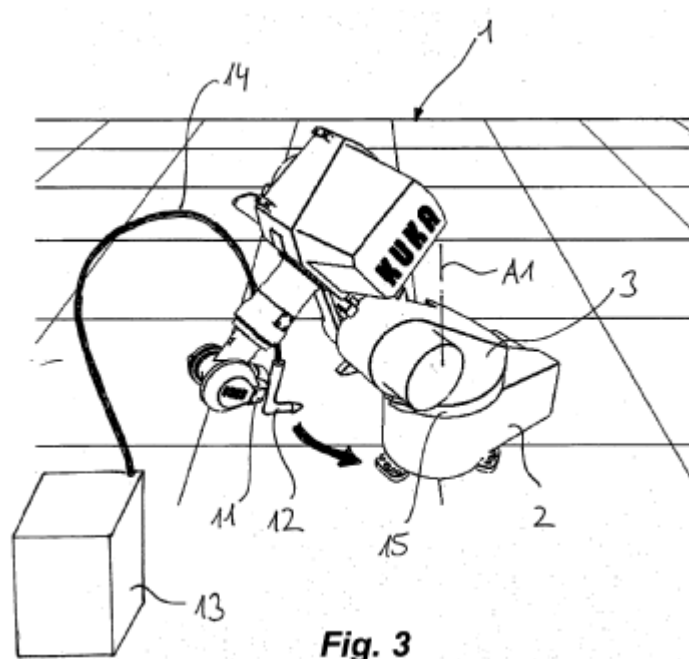
## B25J 19/0058

[N: Dust removing means, e.g. from the gripper]

## Definition statement

This subclass/group covers:

Illustrative example of subject matter classified in [B25J 19/0058](#)



## References relevant to classification in this group

*This subclass/group does not cover:*

Means for preventing dust from entering/escaping manipulators	<a href="#">B25J 19/0075</a>
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## B25J 19/0075

[N: Means for protecting the manipulator from its environment or vice versa]

## Definition statement

*This subclass/group covers:*

Means for avoiding the intrusion of foreign matter, e.g. dust, inside the manipulator or for avoiding the release of harmful matter, e.g. grease particles, from the manipulator into its environment.

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Protective coverings for parts of machine tools	<a href="#">B23Q 11/08</a>
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Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Dust proof; provide cover	3C007/CY29
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## B25J 19/0079

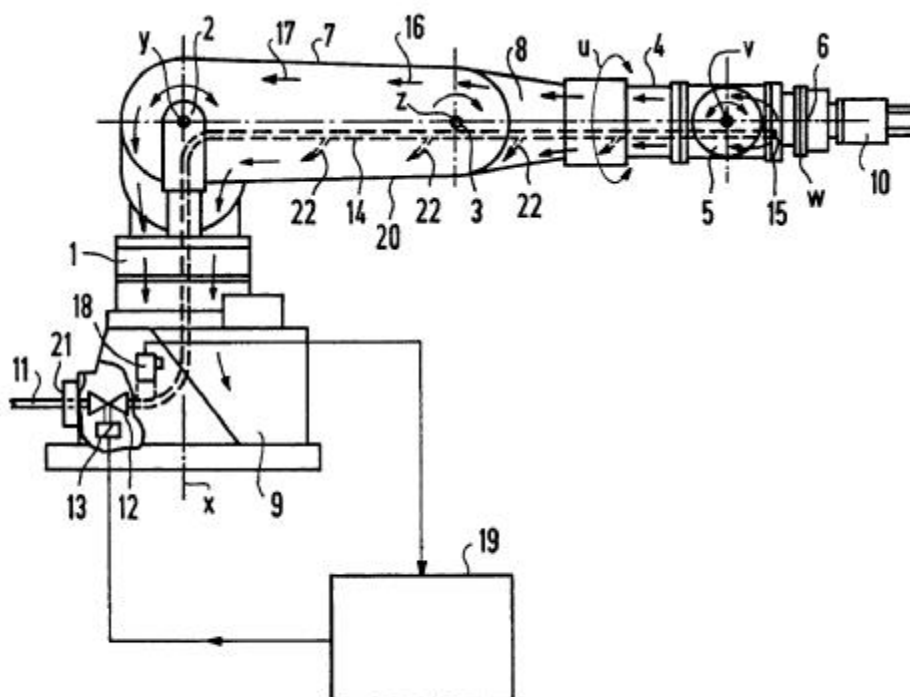
[N: using an internal pressure system]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/0079](#)

EP 0447881



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Dust proof by pressurizing the body	3C007/CY28
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## B25J 19/0083

[N: using gaiters]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in - [B25J 19/0083](#)

US 4762455

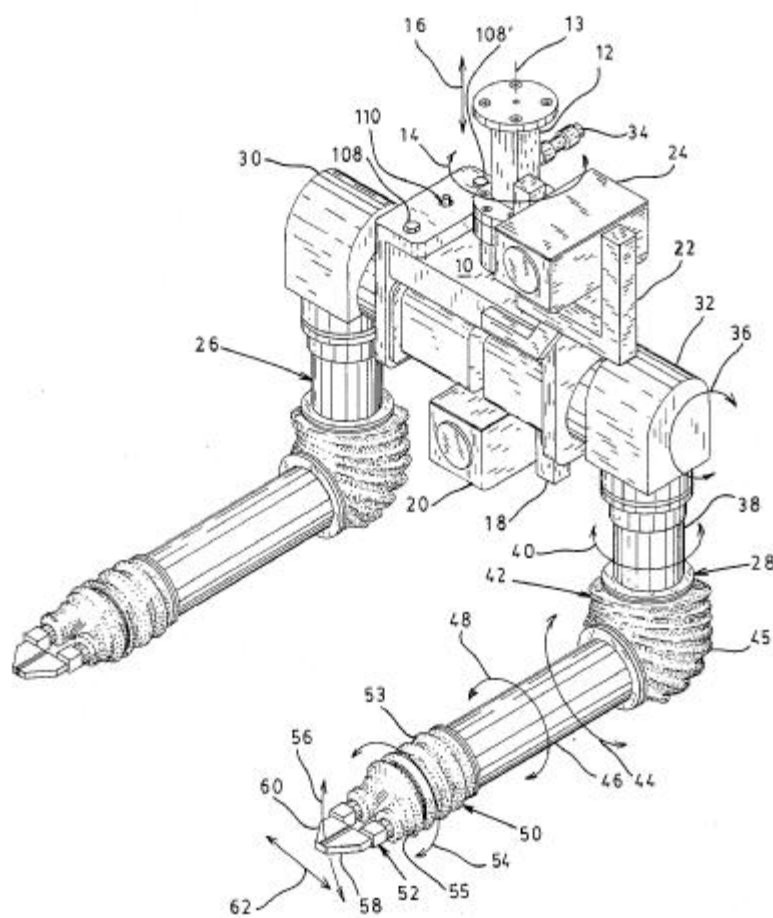


FIG. 1

### Synonyms and Keywords

In patent documents the following expressions/words (EN)"bellow", "(protective) boot", (FR)"soufflet", "manchon (protecteur)" (DE)"schutzbalg" and "faltenbalg" are often used as synonyms.



## B25J 19/0091

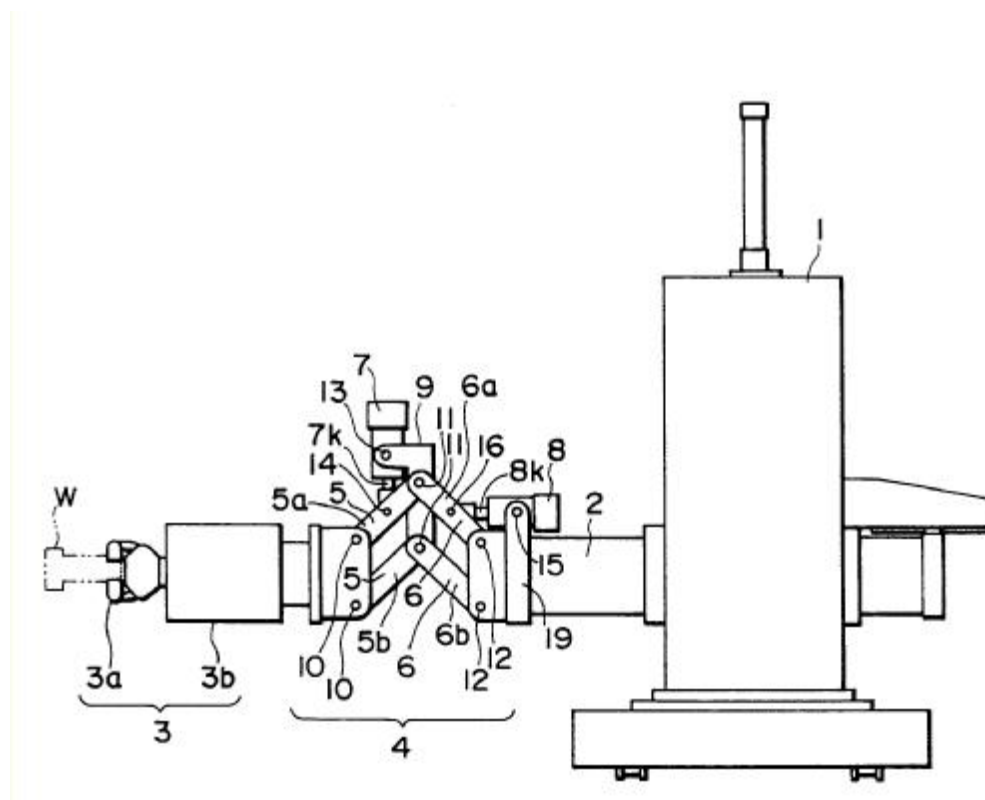
[N: Shock absorbers (in general F16F)]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/0091](#)

EP 0683019



### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Cushioning	3C007/CY32
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## B25J 19/02

Sensing devices

### Definition statement

*This subclass/group covers:*

Sensors fitted on manipulators and not directly used in the control systems of the manipulators.

### **References relevant to classification in this group**

*This subclass/group does not cover:*

Sensors specifically used for controlling manipulators	<a href="#">B25J 13/08</a>
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## **B25J 19/021**

**[N: Optical sensing devices]**

### **Definition statement**

*This subclass/group covers:*

Sensors having optical components.

## **B25J 19/022**

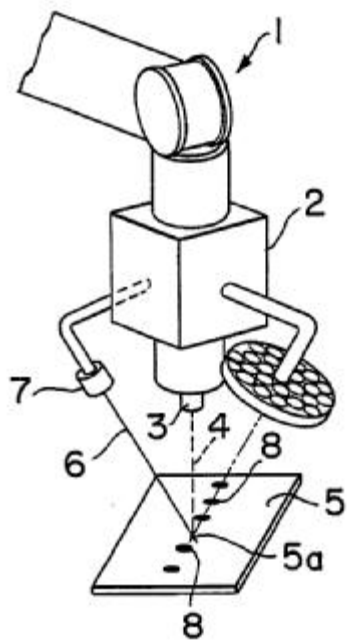
**[N: using lasers]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/022](#)

EP 0339560



## B25J 19/023

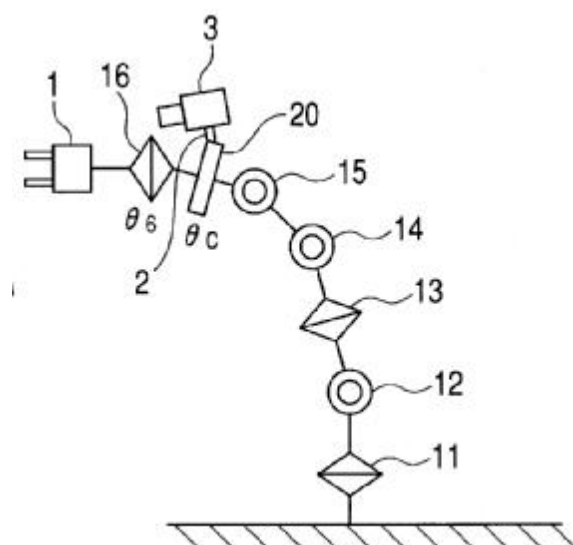
[N: including video camera means]

### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/023](#)

US 2010298978



**B25J 19/025**

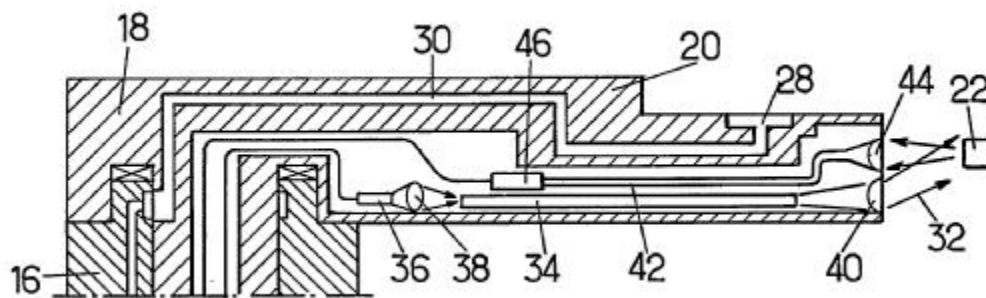
**[N: including optical fibres]**

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/025](#)

FR 2664525



**B25J 19/026**

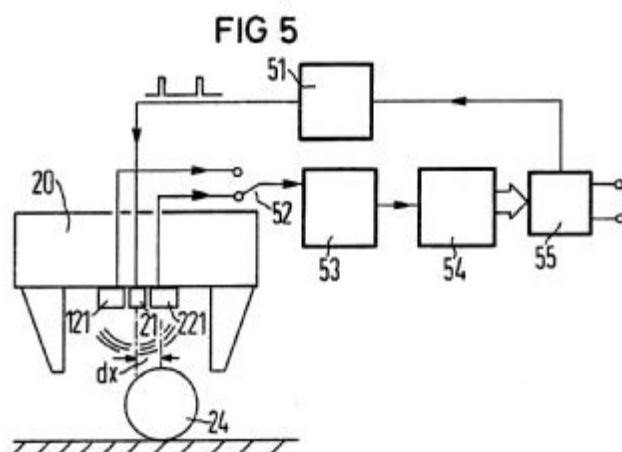
**[N: Acoustical sensing devices]**

## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/026](#)

DE 3409767



### Special rules of classification within this group

This group includes robots with ultrasonic sensors.

## **B25J 19/027**

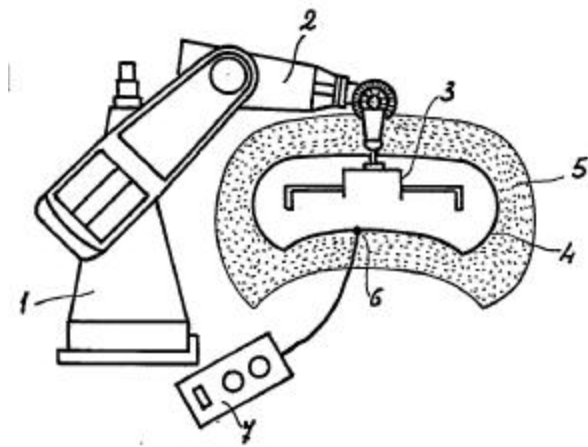
**[N: Electromagnetic sensing devices]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/027](#)

FR 2663105



## **B25J 19/028**

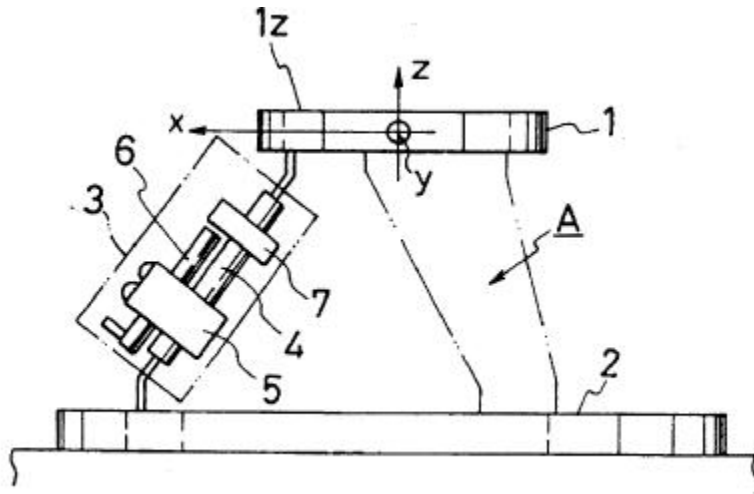
**[N: Piezoresistive or piezoelectric sensing devices]**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/028](#)

US 5511931



## B25J 19/04

### Viewing devices

#### Definition statement

*This subclass/group covers:*

Sensors for capturing an image.

## B25J 19/06

### Safety devices

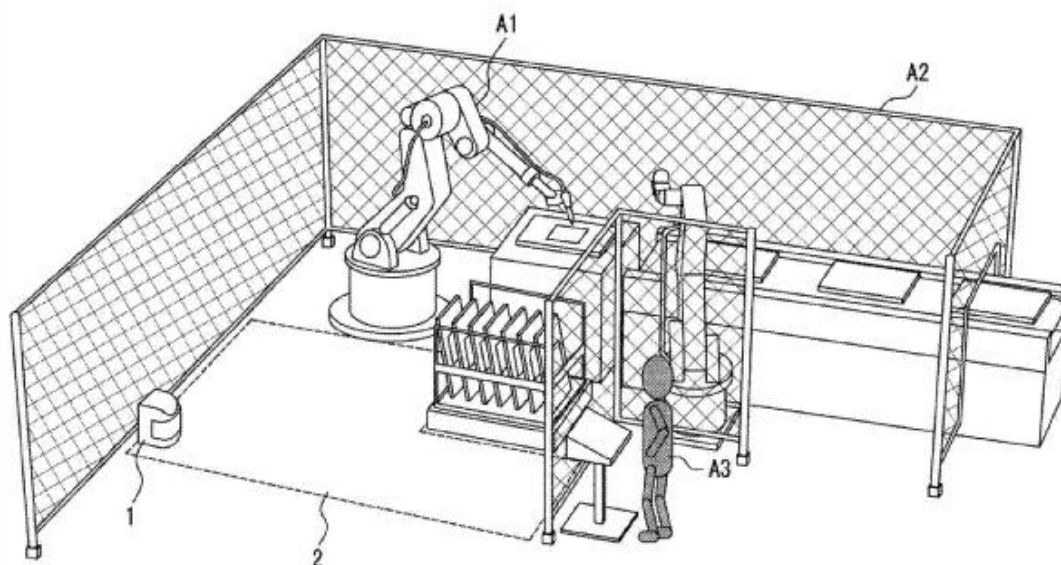
#### Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/06](#)

US 2009295580

FIG. 1



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Safety devices independent of the control and operation of the machine	<a href="#">F16P 1/00</a>
Safety devices acting in conjunction with the control or operation of the machine	<a href="#">F16P 3/00</a>

## B25J 19/061

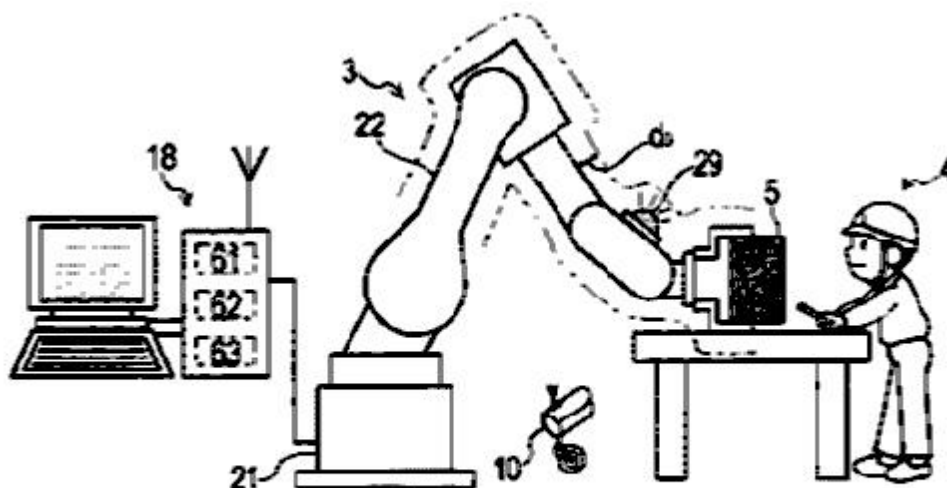
[N: with audible signals (audio controls B25J13/003)]

## Definition statement

This subclass/group covers:

Illustrative example of subject matter classified in [B25J 19/061](#)

JP 2010120139



## Informative references

Attention is drawn to the following places, which may be of interest for search:

Attention is drawn to the following Fterms (Japanese classification scheme), which may be of interest for search:

Safety means with alarm	3C007/MS28
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## B25J 19/063

[N: working only upon contact with an outside object]

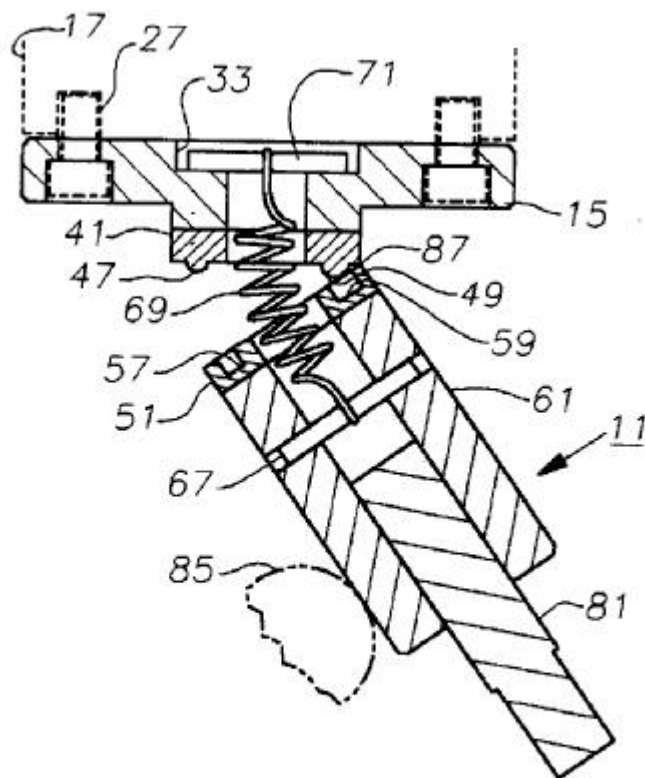
## Definition statement

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 19/063](#)

US 6129476

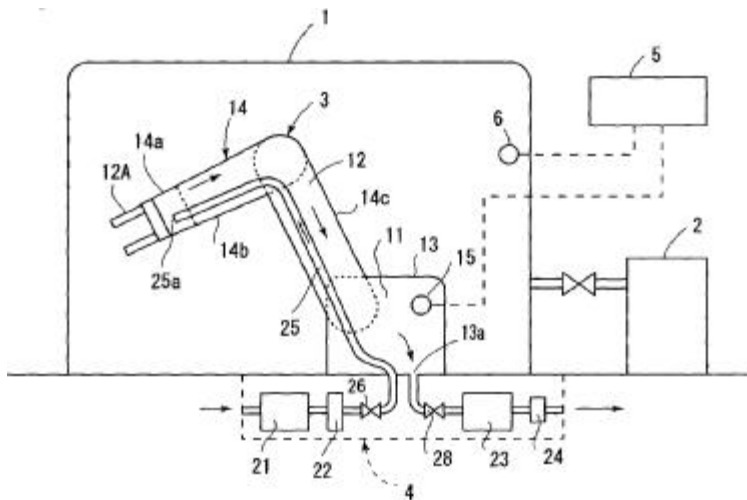




*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 21/005](#)

EP 1557245



## **B25J 21/02**

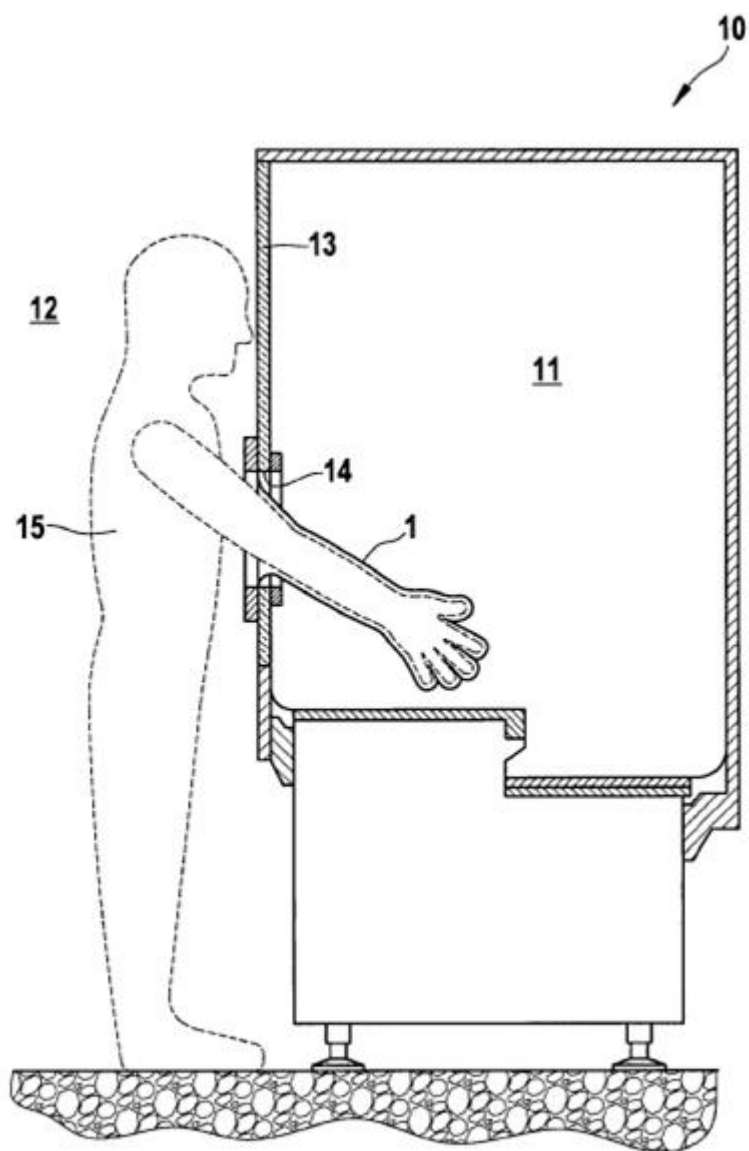
**Glove-boxes, i.e. chambers in which manipulations are performed by the human hands in gloves built into the chamber walls [N: (glove- boxes for removal of dirt B08B15/026; glove-boxes shielded against radiation G21F7/04)]; Gloves therefor**

### **Definition statement**

*This subclass/group covers:*

Illustrative example of subject matter classified in [B25J 21/02](#)

DE 102008001411



**Fig. 1**

## Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Baby incubators	<a href="#">A61G 11/00</a>
Microbiological incubators	<a href="#">C12M 1/005</a>
Apparatus providing an anaerobic atmosphere	<a href="#">C12M 1/045</a>

## Synonyms and Keywords

In patent documents the following expressions/words (EN)"isolator", (FR)"boîte à gants" and (DE)"handschuhkasten" are often used as synonyms.